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ABSTRACT

This handbook describes the processes and techniques used to develop, implement, and evaluate four integrated vocational and academic learning programs in Wisconsin that included students from special populations. The handbook contains seven chapters. Chapter 1 presents an overview of the project, including the request for proposal process and some of the positive outcomes and barriers faced during the implementation process. Chapters 2-5 provide specific information for each of the four projects: (1) Blue Hills Manufacturing Project---used solar-powered kilns to dry lumber for their student-run company; (2) Food for Thought--a "school within a school" that focuses on the integration of academic subject areas and the operation of an in-school breakfast program; (3) Water Quality Analysis Project--integrates a vocational course in natural resources with an advanced chemistry course by focusing on water quality issues; and (4) biotechnology integration project---integrates microbiology with English, mathematics, technology education, and business education. Chapter 6 discusses the team building process that was used with the Vocational Academic Learning Program teams, and chapter 7 summarizes the factors that contributed to the programs' success and the benefits and positive outcomes of vocational and academic integration. Samples of the documents used in the projects, such as schedules, memos, and curriculum, are included in the report. (KC)

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Integrating Vocational & Academic Education

A Handbook Featuring Four Demonstration Sites

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Including Students From Special Populations

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Integrating Vocational & Academic Education

A Handbook Featuring Four Demonstration Sites

Including Students From Special Populations

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Preface

This handbook describes the processes and techniques used to develop, implement, and evaluate four integrated vocational and academic learning programs that included students from special populations. These sites were developed as part of a federally funded research project entitled *Developing Integrated Vocational and Academic Learning Programs at the Secondary and Postsecondary Levels*. Detailed descriptions of these four project sites are provided in the following pages.

Blue Hills Manufacturing Project—utilized solar-powered kilns to dry lumber for their student-run company.

Food For Thought—a "school within a school" which focuses on the integration of academic subject areas and the operation of an in-school breakfast program.

Water Quality Analysis Project—integrates a vocational course in natural resources with an advanced chemistry course by focusing on water quality issues.

Biotechnology Integration Project—integrates microbiology with English, mathematics, technology education, and business education.

This handbook describes the processes and techniques used to develop, implement, and evaluate four integrated vocational and academic learning programs that included students from special populations.

This publication was developed to provide useful information which can be used by others who are interested in replicating theses projects or who might be interested in tailoring this information for use in their own schools. Chapter one overviews the project, including the request for proposal process and some of the positive outcomes and barriers faced during the implementation process. Chapters 2–5 provide specific information for each of the projects listed above. Chapter 6 discusses the team building process which was used with the Vocational Academic Learning Program (VALP) teams.

We hope that this handbook will be helpful to teachers, administrators, employers, parents, school board members and others in the community as they develop integrated vocational and academic learning programs for youths in their communities including those from special populations.

Acknowledgments

We would like to extend our thanks and appreciation to the many people who contributed to the development of this publication. We would especially like to thank each of the VALP teams, our Technical Assistance Committee, and students who participated in the vocational and academic learning projects. We would also like to thank other CEW staff who provided assistance throughout the project.

VALP Teams and students at the following Wisconsin schools:

Spooner Area School District
Sauk Prairie High School
Weyerhaeuser Area School District
Wauwatosa East High School

Technical Assistance Committee Members

Our thanks and appreciation are extended to the VALP Teams and project students, TAC members and our fellow CEW staff.

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Background & Introduction

1

By Lloyd W. Tindall, Project Director, Center on Education and Work

About The Project

As part of a federally funded research project entitled *Developing Integrated Vocational and Academic Learning Programs at the Secondary and Postsecondary Levels,* four Wisconsin secondary schools developed and implemented integrated vocational and academic learning programs that included special populations. The Center on Education and Work (CEW) obtained the funds for this project from the Office of Vocational and Adult Education, U.S. Department of Education. This handbook provides details regarding these four sites and their projects which implemented vocational and academic education.

About Vocational and Academic Integration

According to *Common Good* (1991), a report by the Ford Foundation Project on Social Welfare and the American Future, approximately one in four American teenagers leaves high school before receiving a diploma. Unless we invest in human capital with the same concern for long-range payoffs that venture capitalists bring to investments in new enterprises, our growing under-educated population of teenagers will soon become a growing underprepared work force.

Schools need comprehensive vocational education and school-to-work programs leading students to meaningful careers (National Research Council, June 24, 1993). Because many of their schools lack such programs, minorities and disadvantaged youths who dropout or do not attend college are at high risk of unemployment or underemployment. Adolescents flounder in the labor market, either jobless or obtaining jobs with low wages and little opportunity of advancement. The National Research Council (NRC) states that school counselors spend less time on job placement than any other task. The NRC blames these disparities on the haphazard array of courses available to students, vocational education courses that are not conceptually or programmatically linked, and low achieving students' perception that vocational education classes are a refuge from the demand of academics.

The integration of vocational and academic courses has been recognized as an effective strategy for improving the education and transition of students to employment or continued education. In *Vocational Education for the 21st Century*, Hanby (1992) described a comprehensive curriculum as including a strong academic component to give students a solid foundation in basic skills and to equip them with the higher order level of thinking and reasoning needed for initial employment or entrance into postsecondary

Four Wisconsin secondary schools developed and implemented integrated vocational and academic learning programs that included special populations, as part of a federally funded research project.

education. Grubb (1990) noted that coordination of vocational education with other programs can increase their effectiveness. Grubb and others (1991) found that approaches to integration varied considerably, ranging from marginal changes in existing courses to thorough reform reshaping an entire high school.

The integration of vocational and academic learning is a major feature in the school-based learning component which appears in the School-To-Work Opportunities Act.

The U.S. Department of Education, Office of Vocational and Adult Education addressed these issues by sponsoring a competition to select demonstration projects for the integration of vocational and academic learning programs. The Center on Education and Work at the University of Wisconsin–Madison was one of the eleven applicants selected nationally as a result of this competition. Our goal was to work with Wisconsin educators to develop, test, deliver, and evaluate the impact of effective vocational academic integration that meets the learning needs of special populations as integral components of the integration process. This includes students who are at risk, teen parents, those of limited English proficiency, minorities, and students with disabilities.

The integration of vocational and academic education is an effective strategy to improve the grades, behavior, and interest of students, and improve the transition of students from school to work. The integration of vocational and academic learning is a major feature in the school-based learning component which appears in the School-to-Work Opportunities Act. It is an effective tool for assisting students from special populations to transition from school to work and to higher educational levels. Integration approaches are also a central element in the block grants currently being considered by the U.S. Congress.

The development and implementation of integrated curricula is based on the following premises:

- Vocational academic integration is an effective strategy in the instruction of all students including those from diverse populations.
- Students with disabilities, at-risk students, students with limited English proficiency, minorities, teen parents and other diverse populations of students can benefit from integrated vocational and academic learning programs.
- Integrated vocational/academic education will help to make academic education "real" for students.
- Integrated vocational/academic learning programs improve the transition of students to work and to postsecondary programs and reduce the dropout rate.
- Tech Prep and Youth Apprenticeship initiatives are a necessary part of the integrated vocational/academic learning programs.
- A coordinated vocational/academic curriculum is a necessary part of the broader school restructuring and reform movement.
- Vocational and academic education must become full partners in improving the academic and vocational skills of high school and two-year college students.
- A number of models have been developed that are successful in the integration of vocational and academic education.

A coordinated vocational/academic curriculum is a necessary part of the broader school restructuring and reform movement.

- Vocational and academic educators can work together effectively on the development of integrated programs.
- Integrated vocational/academic programs developed in one school setting can be disseminated and implemented in other school settings.
- An integrated vocational/academic curriculum teaches "authentic" skills and competencies that prepare students for the larger world.

The Process

A formal Request for Proposals (RFP) process was used to recruit secondary and postsecondary schools interested in and committed to the following goals: preparing diverse student populations for work, making academic learning real, and increasing graduation rates of students.

Members of the Wisconsin Tech Prep Consortia were provided with the RFP's. Interested schools submitted proposals to the Center on Education and Work. Proposal requirements and application instructions are shown in *Figure 1.1, Developing Integrated Vocational and Academic Learning Programs Request for Proposal.* Once received, applications were evaluated by third party readers serving on the project's Technical Assistance Committee (TAC). The TAC was instrumental in the selection of the project demonstration sites, and provided assistance in other ways throughout the project. The TAC consisted of twelve members possessing expertise in vocational and academic integration and working with diverse student populations. A TAC was used for the selection process to provide objectivity in the evaluation of proposals. Additionally, the members assisted in the identification and evaluation of existing integrated vocational and academic learning programs; helped recruit and select teams at the school sites; made suggestions regarding the learning programs' content and format; and provided feedback on dissemination efforts and program evaluation.

A formal RFP process was used to recruit secondary and postsecondary schools.

Demonstration Sites

Ultimately, four successful applicants were selected to become demonstration sites for the integration of vocational and academic education. These sites were located throughout Wisconsin at Spooner Area High School in Spooner; Weyerhaeuser Area School District in Weyerhaeuser; Sauk Prairie High School in Prairie du Sac; and Wauwatosa East High School in Wauwatosa. Each school received a $44,000 subcontract to design and implement an integrated vocational and academic education program which included students from special populations.

The winning sites were located throughout Wisconsin in Spooner, Weyerhaeuser, Prairie du Sac, and Wauwatosa.

Selecting the VALP Teams

As detailed in the project guidelines, each school selected a Vocational Academic Learning Program (VALP) team having at least nine members. The VALP teams had to include three vocational teachers, three academic teachers, and three other persons representing special population students. During the summer, the VALP teams spent one week on campus at the University of Wisconsin–Madison, and three weeks at their own school to work on the development of vocational academic learning programs. Staff from the Center on Education and Work provided training and technical assistance to

(Text continued on page 8)

Figure 1.1

Developing Integrated Vocational and Academic Learning Programs Request for Proposal

Program Requirements

Three program requirements need to be addressed in your proposal.

1. Vocational Academic Learning Program Team

Each secondary or postsecondary applicant must develop an integrated Vocational Academic Learning Program Team (VALP Team). Each VALP team must have at least nine members comprised of:

- Three academic staff members
- Three vocational staff members
- A staff member representing students with disability issues
- A staff member representing at-risk student issues
- A staff member representing minority and equity student issues

The VALP team will have a leader/contact person who is continuously available to project staff members. This person would preferably be a building principal or a vocational or academic coordinator at the secondary level or a dean of a vocational or academic area at the postsecondary level.

The VALP team must have ready access to a modern IBM compatible computer and telephone modem to enable team members to communicate with the project director and project staff through the CEW's computer network. This remote access network system will allow VALP teams to transmit and receive messages and documents instantly and to communicate and share ideas with each other and with CEW staff, thus allowing VALP teams to network with each other and to cross-critique programs while in their development stages. The system will be an asset to communications and will speed the development of integrated learning programs.

2. Vocational Academic Learning Program Team Objectives

The objectives of the vocational academic learning program teams are to:

A. Operationally define the team's concept of integrated vocational academic learning. All curricular, developmental, organizational and instructional objectives will be based on each team's operational definition of this concept.

B. Involve vocational and academic instructors in designing curricula at the eleventh and twelfth grade levels that increase the graduation, employment, and transitioning of students to vocational, technical or community colleges, higher education, or work.

C. Involve vocational and academic instructors in designing integrated postsecondary curricula that will lead towards an associate degree or a certificate in a specific occupational area and subsequent employment in the areas of training or enrollment in higher education.

D. Include a broad range of VALP team members that represent the education needs of diverse student populations.

Figure 1.1, continued

Developing Integrated Vocational and Academic Learning Programs

Request for Proposal

E. Coordinate learning program team activities with the school's reform and restructuring plans, Goal 2000 plans, and the National Education Goal #5, Wisconsin's 17 Wisconsin Learner Outcomes, and other related education and training initiatives.

F. Participate in the field testing and revision of the integrated vocational/academic learning program they have developed.

G. Provide a completed copy of the final version of each integrated learning program to the project director.

H. Provide four hours of video tape detailing steps in the integrated learning program's development and operation, how it was revised after field testing and how it can be used by educators in other schools.

I. Participate in CEW sponsored dissemination /training sessions on developing and implementing integrated vocational academic learning programs.

3. Content of the Integrated Curricula

The local VALP teams will have autonomy in selecting the curricula they wish to integrate and the methods of implementation and development of the curricula. However, CEW's request for proposals will give priority to applicants proposing to focus on programs that:

- are carried out under an articulation agreement between secondary and postsecondary participants that commits them to develop and refine a program designed to provide students with a nonduplicative sequence of progressive achievement leading to competencies in at least one field of engineering technology, applied science, mechanical, industrial or practical art or trade or agriculture, health or business;
- consist of the two years of secondary school preceding graduation and two years of higher education, or an apprenticeship program of at least two years following secondary instruction, with a common core of required proficiency in math, science, communication, and technology designed to lead to a certificate or associate degree in a specific career field;
- build student competencies in mathematics, science, and communications (including applied academics) through a sequential course of study that is integrated with the sequential course of study in technical preparation;
- addresses the academic support, personal support, career development needs, and learning style of students from diverse populations;
- includes a process to develop and implement individualized educational plans and programs to meet the needs of participants from diverse student populations into these mainstream coordinated vocational/academic offerings;
- includes a process to develop and implement individualized educational plans and program to meet the special needs of participants, incorporating existing IEP processes for those eligible and extrapolating similar processes for those who are not;

Figure 1.1, continued

Developing Integrated Vocational and Academic Learning Programs

Request for Proposal

- presents evidence of strong administrative support for their staff's extended participation in a project of national significance; and
- provides assurances that CEW staff and VALP team members will have access to all data needed to calculate project processes and outcomes, with a strict proviso for student confidentiality.

Training and Implementation of the Program

Vocational Academic Learning Program Teams will be required to participate in the following training activities. (20 days total)

1. Training and Development workshop to be held at the University of Wisconsin–Madison in June. Old Madison Room, Memorial Union. (Four days)
2. Work on a daily basis at the school site on the development of integrated vocational and academic learning plans during June and July. (Fifteen days)
3. Attend a one day workshop at the University of Wisconsin–Madison in July. Old Madison Room, Memorial Union. (One day)
4. Implement the integrated vocational and academic training program during the school year.
5. Scheduled site visits by CEW staff members.

Application Instructions

The Proposal Application should include an explanation of the following:

Fiscal Agent - Identify a fiscal agent to maintain the financial records of the project. Also identify a primary contact person for the project. These individuals shall be identified on the cover page.

Statement of Need - The statement of need must identify and describe the needs that will be addressed by the project, how the needs will be met and the benefits for project participants. (Maximum 10 points)

Project Objectives - List the objectives and student outcomes that will be attained by the project. The objectives must be related to the needs described above and must also address equity related issues and the needs of special populations. (Maximum 10 points)

Vocational Academic Learning Program (VALP) Teams - Education agencies must identify VALP Team members/positions that will participate in the training sessions to develop and implement the integrated vocational academic learning plans. (Maximum 10 points)

Project Design - The purpose of the project design is to show the scope of the proposal. The scope should Include the competency levels and the length of time by day/semester, as well as the following:

- The design should show how the proposed integrated learning programs works with existing programs and how the integrated learning programs are articulated with secondary or postsecondary programs.
- Describe the curricula to be integrated and the scope of integration. (See pages 5 and 6)

Figure 1.1, continued

Developing Integrated Vocational and Academic Learning Programs

Request for Proposal

- Show how Tech Prep and/or Youth Apprenticeship initiatives are incorporated into the planning process.

The integrated approach must be developed around the student. The project is designed to serve all students including diverse populations. Therefore, the VALP plans should involve the Individualized Education Plan (IEP) (or equivalent at the post secondary level) for special education students and an individualized plan for other students such as students with limited English proficiency, at-risk, or teen parents.

The instructional strategies will be built around individual accommodations, instructional support, and personal supports found effective with special needs students through research. At the post secondary level, the VALP should also include development and implementation of individual learning plans. VALP team plans need to incorporate the Tech Prep and Youth Apprenticeship initiatives in the planning process.

The local VALP teams will document their development and implementation process, provide a copy of the learning plan(s) (minus student identifiers) for reproduction for other schools, produce four hours of video tape illustrating the curriculum development and instructional strategies, and covering suggestions for others who wish to use the learning plan(s) or to use their specific strategies to develop additional learning plan(s). CEW project staff will supervise editing the raw footage into short segments suitable for use in dissemination/training activities. (Maximum 40 points)

Program Evaluation - Continuous evaluation is necessary to facilitate planning and to assist in decision making. Applicants are expected to consider learner access outcomes, learner performance outcomes, labor market outcomes, and local instructional program outcomes. A control group of students similar to those served by the VALP teams should be selected. (Maximum points 10)

Budget - Applicants must provide a budget for the expenditure of the $44,000* subcontract funds for the project period. Allowable expenditures include:

1. Stipends to team members for summer workshops
2. Travel and per diem to participate in the five days of summer workshops on the UW–Madison campus
3. Supplies and materials used in learning program development
4. Stipends to substitute teachers (if needed)
5. Expenses related to planning and development meetings at local sites
6. Video tapes to record development processes
7. Administrative costs (limited to five percent of funded amount)

Pertinent assurances/requirements of the Carl D. Perkins Vocational and Applied Technology Act of 1990, as well as federal and state affirmative action/nondiscrimination requirements regarding all protected classes of individuals must be met after being selected, but before the project is approved for funding. A subcontract will be issued by the Board of Regents of the University of Wisconsin to the winning applicants.

*Funding amount may vary subject to U.S. Department of Education approval.

the VALP teams during these four weeks. The integrated programs were implemented during the 1994–1995 school year. Throughout the year Center staff continued to provide technical assistance to each school through site visits, E-mail, and telephone communications. Interviews with students, teachers, and administrators provided additional information on the progress of the integrated curricula.

Each VALP team was required to include special population students in their integrated programs.

Each VALP team was required to include special population students in their integrated programs. Each school determined, on an individual basis, which population or populations would be served. As a result, a diverse group of students were involved in the vocational academic integrated programming, including those students with learning disabilities, emotional disturbances, at-risk situations, and hearing impairments. Additionally, emphasis was placed on the employment of women in non-traditional roles, at one of the sites.

Planning the Approach

There are numerous approaches and models of integrating vocational and academic education. Each VALP team decided which model, approach, or combination of models they would use when integrating vocational and academic education in their schools. The schools were encouraged to incorporate the Wisconsin Learner Outcomes when developing their integrated programs.

Incorporating Wisconsin Learner Outcomes

The Wisconsin Learner Outcomes were developed by community members and educators from throughout the state. They were developed to incorporate a solid foundation in language arts, mathematics, science, and social studies. Each of the seventeen Wisconsin Learner Outcomes are highlighted below.

The schools were encouraged to incorporate the Wisconsin Learner outcomes when developing their integrated programs.

1. Identify, develop, evaluate, and apply criteria to ideas, products, or performance of one's self or others.
2. Revise a product, performance, system, or idea in response to relevant information.
3. Make informed decisions by examining alternatives and anticipating consequences of actions.
4. Achieve desired results by interpreting and executing instructions, plans, models, and diagrams.
5. Recognize and devise systems and describe their interdependence.
6. Create a quality product, process, or performance that will meet a need.
7. Respond to the aesthetic, intellectual, and emotional aspects of an event, performance, or product.
8. Transfer learning from one context to another.
9. Recognize, define, and solve a problem.
10. Recognize and communicate one's strategies for accomplishing objectives.
11. Work effectively in groups to accomplish a goal.
12. Defend a position by combining information from multiple sources.

13. Develop and test a hypothesis.
14. Recognize when a need for specific information exists and demonstrate the ability to locate, evaluate, and focus that information.
15. Conceive of places, times, and conditions different from one's own.
16. Identify compelling personal interests and goals and pursue them.
17. Recognize the influence of diverse cultural perspectives on human thought and behavior.

Positive Outcomes

During the first year of this project, a number of positive outcomes were observed. Additionally, positive feedback regarding the projects was received from students, teachers, parents, administrators, and community members at the various sites.

Positive feedback regarding the projects was received from students, teachers, parents, administrators, and community members at the various sites.

Benefits for Students

When compared to other, non-integrated classes meeting on a daily basis, daily attendance in the integrated classes was better, overall. Improvement was also seen in the grades of students involved in the integrated programming. Being involved in the integrated programs allowed them to see the relevance of academics to the workplace, the important connections between vocational studies in the transition from school to work.

When students with differing academic achievement levels were united in the classroom, students were able to establish rapport and positive working relationships with one another. Special education students in the integrated classes not only improved in their level of knowledge, but also acquired a new sense of self-esteem. Non-disabled students improved in their ability to accept and understand the difficulties faced by their disabled peers and demonstrated a willingness to assist them in the learning process. The number of discipline referrals also decreased in the integrated settings. Some students were initially apprehensive about becoming a part of a program to integrate vocational and academic education. An orientation was conducted at the beginning of the semester to provide students with a better understanding of the integration process and the project in which they would be involved. When interviewed during the integration process, most students reported positive feelings about the integrated programs and believed that the experience had been profitable for them.

Most students reported positive feelings about the integration process and believed that the experience had been profitable for them.

Teachers' Opinions

For teachers involved in the integrated programs, a lot of additional work was necessary which resulted in the need for time. Teachers primarily work independently and in many cases turf issues presented themselves, even when there was an agreement to collaborate on the development and delivery of instruction. Teachers commented that the time spent planning and developing the vocational and academic integration was crucial. Once school began in the fall, there was no time to spare. The work load had to be divided into manageable components. At times, making things manageable changed original ideas. However, when necessary, beginning with specific goals and expanding over time seemed to work well.

Administrative, Community, and Parental Support

Support from school administrators is also a critical component to the successful implementation of vocational academic programs. Administration can be extremely helpful with logistics such as arranging for substitute teachers, planning student or class schedules, and encouraging involvement and support among teachers.

When employers and community members were involved, they were very supportive of the integrated curricula and activities. There was an increase in the amount of exposure students had to business, industry, and the world of work which was evidenced by guest speakers and field trips. Students were able to hear first hand what skills and competencies employers are seeking. Often, employers were able to assist with the development of curricula which would integrate vocational and academic education in conjunction with work related competencies.

Parents were also affirmative about the integrated programs. In some cases parents not only witnessed changes in the students' attitudes towards school, but also saw improvements in self-esteem and confidence levels.

It is our hope that through this publication, and the detailed descriptions of these four integrated programs, other schools will implement plans to integrate vocational and academic education that will include students from special populations.

Potential Barriers

Although barriers can exist, it is important to keep in mind that they can also be overcome. An obvious barrier to the integration of vocational and academic education is a non-supportive administration. It is extremely difficult to carry out a plan for integration if the administration does not support that plan.

Additionally, time to plan, develop, and implement a process for integrated activities is a must. Extra time is best obtained during the summer months, as teachers are often overwhelmed once school begins. When faculty are working extra hours to promote the integration of vocational and academic education, this in most cases translates into the need for financial resources to provide stipends for teachers who attend workshops and curriculum development sessions.

Cooperation and teamwork are also essential to a smooth integration project. The work load must be evenly divided among the VALP team members in order to prevent one individual from assuming all of the responsibility. The integration process was different in each school, yet a common thread was that each project continually evolved throughout the implementation phase. In most cases, the schools have already noted things that they would like to do differently as they continue their projects in the future.

Plans for the Future

After implementation during the 1994–1995 school year, three of the four demonstration sites will continue their projects in the 1995–1996 school year. The fourth site is doing some restructuring and will not continue in 1995–1996; however, they will resume the integration project in the 1996–1997 school year. It is our hope that through this publication and the detailed descriptions of these four integrated programs, other schools will implement plans to integrate vocational and academic education that will include students from special populations.

Blue Hills Manufacturing Project

2

Conducted by Weyerhaeuser Area School District
Compiled by Bonnie Roush Phelps, Center on Education and Work

Key Features

The Blue Hills Manufacturing Partnership (BHMP) at Weyerhaeuser Schools was developed to provide students with a school-based work experience to prepare them for work and further education. The Blue Hills Manufacturing Partnership LLC is a solar-powered lumber drying entrepreneurial venture, which is managed by the students. It is unique to Wisconsin and to our knowledge, is one of two in the entire United States. LLC means that the students have formed a legal Limited Liability Company that is registered with the state and federal governments. A unique feature of this project is that it is now an on-going and integral component of the school district and will continue to develop and expand. The Blue Hills Manufacturing Partnership will provide the opportunity for future students to experience a school-to-work program.

A unique feature of this project is that it is now an on-going and integral component of the school district and will continue to develop and expand.

Demographic Information

Weyerhaeuser calls itself and its 282 residents "The Biggest Small Town in Wisconsin." At one time, the area was famous for the virgin timber that dominated the landscape, but by 1904 the area had been clear cut and left to the slow process of regrowth, without benefit of replanting. Weyerhaeuser is located in Rusk County which has the third highest unemployment rate in Wisconsin and the fifth lowest per capita income. There is virtually no industry in this small community except for one lumberyard, a combination grocery/hardware store, a day care center, and a couple of taverns. As a result of limited resources, students have minimal opportunities to gain work experience and employability skills training.

During the 1994–95 school year, there were 78 secondary students attending school at the K-12 Weyerhaeuser Area School District building. Of these students, 14% were classified at-risk or having special educational needs, 25% gifted and talented, 5% of limited English proficiency, and 44% whose families' incomes are below the U.S. Department of Labor definition of poverty level. In 1994, 100% of Weyerhaeuser's graduating seniors continued on to postsecondary education, including university and technical college programs.

Weyerhaeuser had 100% of their graduates continue on to postsecondary education in 1994.

With so few staff, teachers and administrators find themselves "wearing multiple hats," and serving on numerous committees. Teachers generally need to prepare for up to seven different classes per day, and many teach more than one subject area in order to offer their students a full curriculum. For example, the Business Education teacher also teaches Spanish, even to the primary students. The Principal is responsible for all grades K-12. The

Guidance Counselor/School Psychologist also serves as the School-to-Work Transition Team Leader for all grade levels. There is no curriculum specialist or director of curriculum/instruction to guide curriculum change efforts, and teachers have had little opportunity to collaborate on curriculum development prior to their participation in CEW's IVAE project. This project has provided the staff at Weyerhaeuser the opportunity to work together to bring about a positive change that will continue to benefit all students.

All subject areas and disciplines have been, or are scheduled to be, involved in this on-going, innovative integration project.

Participant Information

During the first phase of this project, all juniors and seniors participated. This year, there were 16 juniors and 22 seniors involved in the main focus of the project, but all students, K-12 managed to get involved in one way or another.

All subject areas and disciplines have been, or are scheduled to be, involved in this on-going, innovative integration project.

▲ ***VALP team members (from left) Mike Breed, Joe Svejda, Ron Weber, Richard Manor and Tony Ziesler.*** ▲

The VALP team consisted of academic and vocational teachers, as well as, persons representing students from special populations.

VALP Team Information

The original Vocational Academic Learning Program (VALP) team members that attended the Center on Education and Work (CEW) summer training in Madison, Wisconsin included:

Richard Manor - Technology Education, Project Coordinator
Marcia Hochhalter - District Administrator, Equity Coordinator
Joe Svejda - Eighth Grade Teacher, Umbrella Committee Chair
Linda Cate Dunahee - Assistant Director of Instructional Services, CESA #10
Lisa Warren - Family and Consumer Education
Tony Ziesler - Math (9-12)

Mike Breed - Social Studies (9-12)
Ron Weber - Science (9-12), JTPA Coordinator
Shirley Rouleau - School Board Member

As the project progressed, additional team members became involved, including:

William Simpson - Chemistry, Physics, Computers (9-12)
James Joslin - Guidance Counselor, School Psychologist (K-12)
Barbara Lorkowski - Principal (K-12), At-Risk Coordinator
Celeste Murray - Special Education Teacher (K-12)
Jane Spears - Business Education (9-12), Spanish (3-12)
Jaci Shuda - Art (K-12), Yearbook Advisor
William Jodar - English (9-12)
Gary Hecimovich - Music (K-12), Band Leader
Todd Solberg - Fifth Grade
Janet Kaminski - Physical Education (K-12)

The VALP team received training during the summer at the UW-Madison campus.

Project Goals

The mission of the Blue Hills Manufacturing Partnership at Weyerhaeuser Schools is to provide the students with a school-based work experience to prepare them for work and further education. The goals of the project were:

1. To develop an integrated curriculum in which content and delivery focus on authentic tasks related to school-based work experience.
2. To develop and implement individual educational plan/program to meet the needs of identified students.
3. To develop learning, personal/social, and career/vocational objectives.
4. To develop articulation agreements between area technical colleges and universities.
5. To develop and implement a portfolio system that incorporates career and other relevant material.

The objectives of the Blue Hills Manufacturing Partnership are as follows:

1. Students will demonstrate higher levels of achievement in math, science, and communications, and will increase their technical competence.
2. Students will experience learning activities appropriate to their individual learning styles and motivation, based on authentic life and work tasks.
3. Students will have written career plans throughout high school along with career goals and strategies to achieve them. Students will leave high school with plans for postsecondary education and/or work.
4. Students will experience and succeed in an uninterrupted continuum of learning and experiences. This continuum will be guided by curriculum maps for specific postsecondary programs, which complement their career plans.
5. Students will develop, market, operate, and maintain a business to dry lumber.
6. Students will learn wood construction techniques by building solar powered, wood drying kilns.

Students will demonstrate higher levels of achievement in math, science, and communications and will increase their technical competence.

7. Students will design, manufacture, and market wood-based products.
8. Students may earn advanced standing and/or develop skills that will help in the transition from high school to postsecondary education.
9. Students will develop work competencies.

Project Design

Initially, the design of the program was developed in an outline format consisting of the following information.

Program Focus

1. As students participate in decision making processes within the context of their own communities, they learn more about both themselves and their communities.
2. Students begin to see a connection between what they learn in class and what they need to succeed in a career.
3. The increased understanding and involvement in their communities makes their education more outcome-based, develops youth leadership, and makes a difference in our children's perception of where they live.
4. Our youth, a very precious resource, begin to see their communities as places for the future, not just a place to leave from someday.

Students begin to see a connection between what they learn in class and what they need to succeed in a career.

Phase I: Program Start-up

1. Interview with administration and instructors.
2. Identify teacher(s)/curriculum area(s) of implementation.
3. Determine structure of program, set budget, obtain funding.
4. Develop interest in program by inviting enthusiastic entrepreneurs to classrooms to speak.
5. Set up community advisory board to provide mentor assistance.
6. Teacher in-service.

Phase II: The Community, the Entrepreneur, and You

Student Outcome: Student develops interest/investment in the community and becomes an active community participant.

Areas of Study:
1. The Entrepreneur
2. Community Study of Demographic Base and Economic Characteristics
3. Community Participation
4. You as "Entrepreneur"

Phase III: Fitting the Needs of Business to Community

Student Outcome: Student researches and plans an economically viable business in their community or for the future.

Areas of Study:

1. The Vision
2. "What will I do and how will I do it?"
3. Business Planning—The "Why's"
4. The Company, The Industry, and The Product
5. The Market/Understanding Your Market
6. Manufacturing and Operating Plan—The Economics of the Business
7. Marketing Plan
8. Management Team and Personnel
9. The Financial Plan—The Bottom Line
10. The Executive Summary
11. Business Plan Presentation

Phase IV: Implementation

Student Outcome: Student begins and manages a business.

Areas of Study:

1. Start-up
2. Ribbon Cutting
3. Continued Mentor Assistance (on-going throughout the program)

Note: Skills developed in Phases II–IV are primarily outcome-based. Among others, they include decision making, advertising, marketing, writing business letters, and giving oral presentations to the advisory board members, and development of cooperative learning skills. Benefits to the community include the development of this new business, increased tax base, increased youth leadership, and flow from the school to community.

Skills developed include decision making, writing business letters, advertising, marketing, and giving oral presentations to the advisory board members.

Phase V: Evaluation and Assessment

1. Evaluation by members of advisory board, instructors, school administrators, and economic development entities.
2. Evaluation to include program focus, curriculum, program application, post-graduation period, and suggestions for the future.

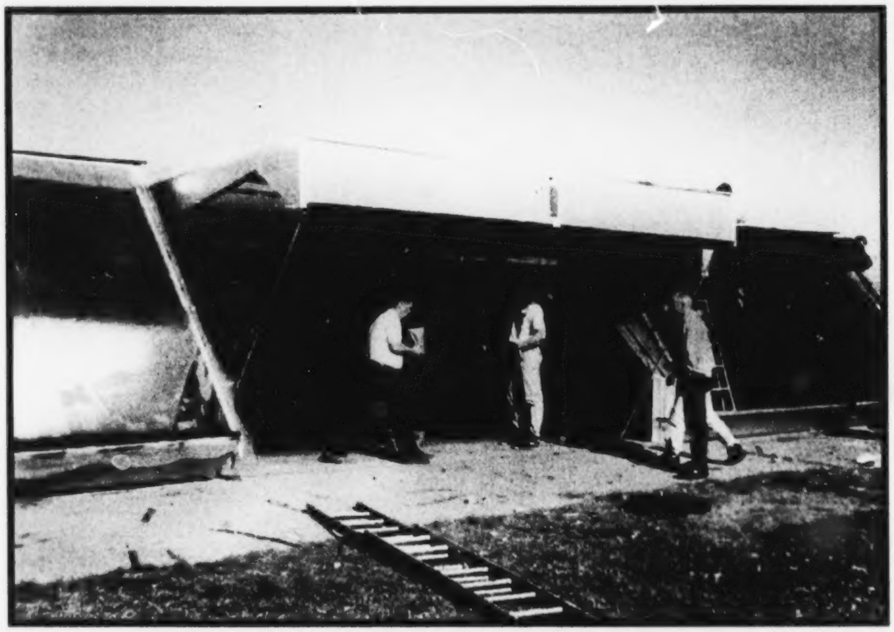
Design of the Partnership

There are two stages planned for this enterprise; the first being a student run company which uses solar-powered, lumber drying kilns as the main focus. A research and development center for wood-based products will be developed which will help lead to stage two, increasing community employment opportunities for students. This year, the community of Weyerhaeuser was awarded a federal grant to start an incubator business. A twenty-thousand square foot building has been constructed. The integration grant was a factor in the decision by the county for the location of this building. Next year, some of the students in the integration project will be researching businesses that could be profitable in this new building. Hopefully, someone will start a wood-based products business where students could learn the concepts and processes involved in authentic, world of work tasks, outside of the school environment. This is the long-term goal of stage two.

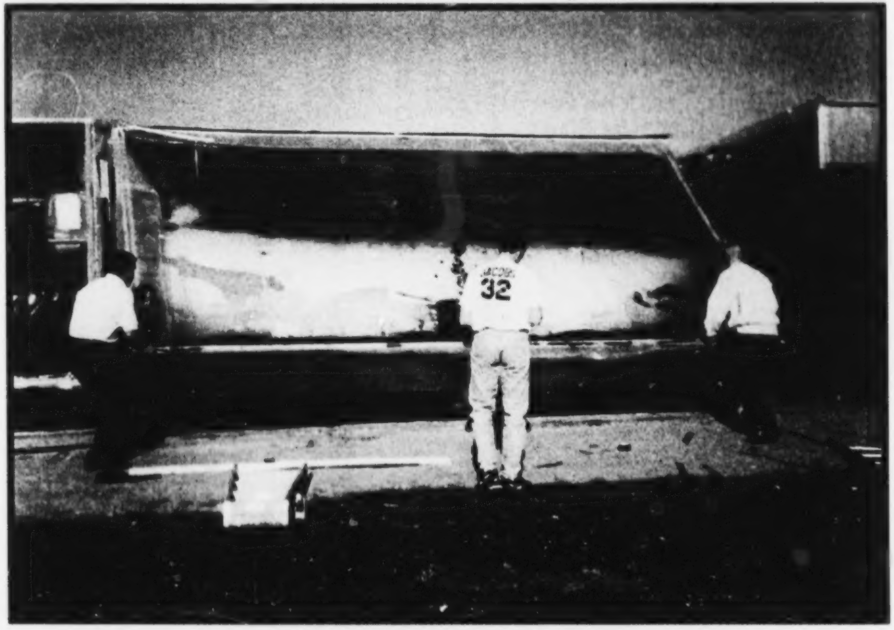
Stage I is a student run company which uses solar-powered, lumber drying kilns as the main focus.

Three 18-foot SolarDry kilns were purchased from Wood-Mizer Products, Inc. of 8180 West 10th Street, Indianapolis, Indiana 46214-2400; (800) 553-0182. The Weyerhaeuser School District found a local trucking company willing to donate the space in their truck to transport the kilns for free. Wood-Mizer sent a manual that contained drawings and lists of building materials required to construct each of the SolarDry kilns. Students in the junior and senior classes provided the labor to construct all three kilns, and a 16' x 24' lumber storage area. Even the fifth grade students became involved by

Community support of this project was strong from the start.



▲ *Solar-powered kilns under construction.* ▲



▲ *Kilns nearing completion.* ▲

calculating how much concrete would need to be poured for the foundation of the lumber storage area.

VALP team members presented the concept and plans for the Blue Hills Manufacturing Partnership at the Weyerhaeuser School District's annual meeting on September 1, 1994. Community support of the project was strong from the start. The school board agreed to purchase .57 acres of land adjacent to the school property to allow for playground expansion. This was needed in part because playground equipment had to be moved to accommodate the location of the BHMP kilns. Approval was also granted to pay for fencing to enclose the kiln area, as recommended by the district's insurance provider.

Student-Run Operation

The operation was meant to be student-run. Position openings were posted and students learned how to organize a resume and letter of application with the assistance of the English and business education instructors. Actual job interviews were held in front of all of the members of the junior and senior classes and were videotaped. A project staff member from the Center on Education and Work, as well as a local business person, conducted the interviews. Selected applicants were determined by a total score consisting of a resume (25% or 75 points), cover letter (25% or 75 points) and the actual interview (50% or 150 points). Later, the videotaped interviews were reviewed by the students so that they could learn from this experience.

A president, vice president, management team leader, production team leader, and marketing team leader, as well as seven board members were 'hired" and took over the operation. These students then "hired" other students to work on the various projects that were proposed. With varying class sizes, the number of students enrolled each year will determine the number and type of positions held on each team, due to limited class size. The student board and officers met twice a month to set bylaws, determine the operating policies, work on marketing plans, and conduct various business operations.

The student board and officers met twice a month to set by-laws, determine the operating policies, work on marketing plans, and conduct various business operations.

The management team consisted of the team leader, positions in accounting, finance, administrative assistance, human resources, as well as corporate secretary, personnel records clerk, biweekly report coordinator, stockholders records clerk, sales manager, accounts receivable clerk and sales manager. Content areas which centered around these positions included science, business education, English, mathematics, economics, and technology education.

The production team consisted of the team leader, quality control officer, and positions related to safety, manufacturing, and construction. Content areas involved with these positions included technology education, family and consumer education, English, physics, chemistry, physical education and science.

The marketing team consisted of the team leader and promotion, advertising, and communications positions. Subjects which integrated curricula related to marketing included media, art, family and consumer education, English, music, and technology education.

The initial VALP team, additional teachers, and the students all worked together to develop job descriptions for the key job descriptions for the partnership, which are detailed below. Questions asked during the interview process are also highlighted.

Job Description: Board of Directors (Student)

Duties: The control of the Blue Hills Manufacturing Partnership's (BHMP) business and affairs shall be vested in the President, Vice President, and Team Leaders, under the direction of the Board of Directors.

1. The student members of the board of directors (SBD's) will work with the President, Vice President and other board members to oversee operations of the Blue Hills Manufacturing Partnership.
2. The SBD's will work with the President and Vice President to establish company by-laws, operating procedures, and business policy.
3. The SBD's shall work with the Board of Director's in the "hiring" and "firing" of company team leaders and other student positions.
4. The SBD's shall work with the general Board Members to set policy which will safeguard the stock of all company members.
5. The SBD's shall work with the Team Leaders to further the growth of the BHMP.
6. The SBD's shall be responsible for proofreading all monthly reports from all student positions two days before the monthly meetings.
7. The SBD's shall assist the President and Vice President with the organization of monthly meetings and the annual report.
8. The SBD's will work with the Board of Directors, Team Leaders, President, and Vice President to establish stock payments, company investments, scholarships, and disposition of any other capital surplus.
9. The SBD's will organize, coordinate and be responsible for running the monthly and annual meetings in conjunction with the President, Vice President, and Team Leaders.

The SBD's work with the President and Vice President to establish company by-laws, operating procedures, and business policy.

Job Description: BHMP President

Duties: The President of this student enterprise shall preside over all top level management meetings, appoint members to some management positions not applied for (or as needed), and deal with top management issue policies and problems.

1. The President will provide leadership to the enterprise and to top level management (board of directors).
2. The President will be responsible for top level planning and organization of the three administrative branches of the enterprise (Management, Marketing, and Production).
3. The President will develop objectives, policies, and procedures for the enterprise. For example, business organization, company policies, and tax status. He/she will work with the board on all other legal documents.
4. The President will maintain a cooperative attitude and keep the other members of the enterprise engaged in constructive activity.
5. The President will see that a written report is turned in each month by all department team leaders covering all phases of the operation.

The President maintains a cooperative attitude and keeps the other members of the enterprise engaged in constructive activity.

6. The President will be responsible for the development and organization of the annual report. A neat, concise copy of this report will be handed in to the instructor on May 15th of the school year.

Job Description: BHMP Vice President

Duties: The Vice President of this enterprise shall assume all duties of the President if the President is not able to perform those duties. The Vice President must be familiar with all aspects of the business.

1. The Vice President will preside over any and all meetings if the President is not able to perform those duties.
2. The Vice President must organize the monthly reports from the other entities of this business and submit them to the President.
3. The Vice President must assist the President with the development of the annual report.
4. The Vice President shall see that all team leaders are properly trained in accordance with the instructions of the President.
5. The Vice President shall assist the President in seeing that all phases of the business are operating as described in the company policy.
6. The Vice President shall oversee team leaders and report to the President on the fulfillment of their respective duties, as described in the job descriptions.

The Vice President organizes the monthly reports from the other entities of the business and submit them to the President.

▲ *From left to right: Dan Manor, SBD; Woody Johns, PTL; Jenny Jacobs, MTL; Zach Kostka, MaTL; Heidi Rouleau, SBD; Ivan Martin, SBD-Chair; Katie Checkalski, SBD; Clint Breed, SBD; Chris Koehler, VP; and Richard Manor, Project Coordinator.* ▲

Job Description: Management Team Leader (MTL)

Duties: The Management Team Leader shall oversee all phases of management including accounting, finance, and human resources. This includes supervision of the following personnel: company secretary, monthly report coordinators, sales manager, accounts receivable and sales records clerks.

The MTL will submit a monthly report to the President detailing the activities of the Management Team.

1. The MTL will work with the President, Vice President and teachers in science, business, English, math, economics, and technology education to determine which students will assume the above positions as described in the MTL duties and company policy.
2. The MTL will submit a monthly report to the President detailing the activities of the Management Team.
3. The MTL will evaluate student job performance and take actions to assure quality work.
4. The MTL shall develop job descriptions for each of the positions in the management area.
5. The MTL will develop management department policies and procedures.
6. The MTL shall be responsible for training for the management positions.
7. The MTL will be directly responsible to the President.

Job Description: Marketing Team Leader (MaTL)

Duties: The Marketing Team Leader shall organize all phases of marketing, advertising, and communications, to promote the business and any products produced.

The MaTL is responsible for training all marketing positions.

1. The MaTL will work with the President, Vice President and teachers in the media center, art, business, family/consumer education, English, physics, technology education, and music to determine which students will assume the above positions as described in the MaTL duties and company policy.
2. The MaTL will submit a monthly report to the President detailing the activities of the Marketing Team.
3. The MaTL will evaluate student job performance and take actions to assure quality work.
4. The MaTL shall develop job descriptions for each of the positions in the marketing area.
5. The MaTL will develop marketing department policies and procedures.
6. The MaTL shall be responsible for training for the marketing positions.
7. The MaTL will be directly responsible to the President.

Job Descriptions: Production Team Leader (PTL)

Duties: The Production Team Leader shall organize all phases of production including supervision of the following positions: quality control manager, safety specialist, manufacturing director, construction engineer, and human resources specialist.

1. The PTL will work with the President, Vice President and teachers in technology education, family/consumer education, English, physics/chemistry, guidance, physical education, and science classes to determine which students will assume the above positions as described in the PTL duties and company policy.
2. The PTL will submit a monthly report to the President detailing the activities of the Production Team.
3. The MTL will evaluate student job performance and take actions to assure quality work.
4. The PTL shall develop job descriptions for each of the positions in the production area.
5. The PTL will develop production department policies and procedures.
6. The PTL shall be responsible for training for the production positions.
7. The PTL will be directly responsible to the President.

You will be part of a team; how will you handle it if your a co-worker disagrees with some your ideas?

Interview Questions

Students participated in actual interviews to obtain positions within the Blue Hills Manufacturing Partnership. Each applicant was asked the following questions.

1. Why do you want to part of the BHMP Team?
2. You will be part of a team; how will you handle it if your a co-worker disagrees with some your ideas?
3. You will be a [team leader]; how will you handle disagreements between your staff?
4. Tell me why you think we should hire you for this position.

Writing Skills

1. You will be responsible for putting together written reports; how do you feel about that?
2. The reports will have to be edited and put together in a professional but user friendly format; why do you think you are the best person for this?
3. As a [team leader] you have to prepare monthly reports. The report is due and there is a big basketball game the night before the due date that everyone is going to. How do you handle this?

Presentations

1. How do feel about presenting to the Board of Directors, School Board or others who would like to learn the happenings of the BHMP?
2. [President, Vice President] you are responsible for running and controlling all the Board of Directors Meetings. Tell how you would run a meeting.
3. One of your friends clearly is not holding up his/her responsibilities on the BHMP team. Tell me how you would handle this as the [President, VP]?

The company strives to make a profit and to share that profit, or a portion of it, with the members of the company.

The Profit Sharing Program

The company strives to make a profit and to share that profit, or a portion of it, with the members of the company. Stock was determined to be the most appropriate method to achieve this objective. Once per semester, each member of the company receives one share of stock for his/her participation effort. In addition, each class (as a group) receives one share of stock for each student who participates.

Extra Shares:

1 Student board members receive two additional shares.
2. Team leaders receive two additional shares.
3. Vice President receives three additional shares.
4. President receives three additional shares.
5. Students receive one quarter of an extra share of stock for the attainment of an A or B honor roll for a nine-week period.

In the future, some of the profit will be returned to the business and some will be allocated for scholarships.

Loss of Stock

1. Each member loses one quarter of his/her membership share for each in-school suspension served. In addition, that member's class also loses one quarter of a share.
2. Each member loses one half of his/her membership share for each out-of- school suspension served. In addition, that member's class also loses one half of a share.
3. Once a member loses his/her share or shares, his/her class does not lose additional shares if that member's actions continue to lose shares.

Stock Distribution

Stock accumulates until the senior class trip. At that time, students exchange their stock for the face value determined by the worth of each share, which is based on the success of the business. This profit can then be used for the class trip, graduation expenses, etc. Stock accumulated by the class as a group goes into the class fund. Members of the company may buy, sell, or trade their stock at any time. In the future, some of the profit will be returned to the business and some will be allocated for scholarships.

Transition from School-to-Work

As this project continues to evolve, students participating in the Blue Hills Manufacturing Partnership will be able to use the skills acquired through this program to gain entry level or advanced placement in various courses or programs at Wisconsin Indianhead Technical College (WITC). Informal articulation agreements have been developed between Weyerhaeuser and WITC and on-going discussion, planning and cooperation continue. Entry level or advanced placements are possible in wood technics, mechanical design, mechanical and computer drafting, architectural commercial design, and various business classes offered by WITC.

Students will be able to use the skills acquired through this program to gain entry level or advanced placement in courses or programs at Wisconsin Indianhead Technical College.

Curricula and Implementation Considerations

During the summer of 1994, the Weyerhaeuser VALP team developed their action plan to integrate vocational and academic curricula. A copy of their initial action plan is included in *Figure 2.1, Action Plan*. Teachers at Weyerhaeuser High School developed a format for outlining integrated curricula. Examples of these outlines and associated assignments are included after *Figure 2.1*.

(Text continued on page 31)

Figure 2.1 Action Plan

Action Plan	**Weyerhaeuser Area School District**
Curricula Subjects to be Integrated Economics, Family and Consumer Education, Mathematics, Science, Art, Business Education, English	**Grade Level of Integrated Curricula** Grades 11-12
Length of Integrated Approach First semester of 1994-1995 school year and ongoing	**# of Students** 35-40

Objective

To develop an integrated curriculum that uses entrepreneurship to involve students in work-based, relevant, hands-on learning experiences.

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Videotape	
				Yes	No
A. Orientation					
1. Inservice for students.	VALP Team	August 1994	Program Plan	X	
2. Inservice for parents, business and community.	VALP Team	Annual mtg.	Program Plan	X	
3. Inservice for staff.	VALP Team	Aug. 1994	Overheads	X	
4. Identify resources needed for planning process. a. Child care services b. Expertise	Lisa/Marcia	Aug. 1994			

Figure 2.1, continued

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
5. Promote Wisconsin Manufacturers and Commerce (WMC), Department of Public Instruction (DPI), and Business World.	Marcia / Lorkowski		Grant card file or data base file		
6. Student corporation reports (updates) to school board monthly.	Manor and VALP Team	Oct. 1994 Board meeting			
7. Ethics and conflict of interest.	Marcia / Lorkowski	Aug. 1994	Parent-Teacher Handbook		
8. Videotape waiver.	Marcia / Lorkowski	Aug. 1994			
9. Explanation of expectations for students.	VALP Team and all faculty		Essential Work Skills; WI Learner Outcomes		
10. TQM - Work Team.					
11. Governing board or board of directors; establish process for a governing board. Include (2) students, faculty, business, and community.	Tony		Bylaws	X	
B. Research and Product Development (Customer-Dried Lumber).	Dick	Ongoing			
1. Survey and collect data labor market info (number of dried hardwood users) • Manufacturing Association, Small Business Association, Census Bureau.	Tony / Bill S.	July 1994	Joslin / Garbacz / Marcia / Dick	X	
2. Analyze data.	Tony / Bill S.	July 1994			

Figure 2.1, continued

1. **Tasks** A. **Activities required to achieve each task** B.	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
3. Determine product line(s). • Alternative energy products, other products to dry	Ron / Lisa	July 1994			
4. Test sample of product for quality control. • Resources for testing	Dick / Bill S.	Ongoing	Microwood oven volume measuring equipment		
5. Cost estimate and pricing.	Tony /Jane / Bill S.		Software for business	X	
6. Distribute product.	Ron / Dick				
7. Evaluation of product and process.	VALP / All				
8. Contact other businesses in Wood Kiln Tech.	Dick / Shirley				
C. Financial and Business Services.					
1. Establish accounting, taxes, and legal system • Data base system, double line entry • Inventory system	Jane / Shirley	1994-95 school year	Bill / Jane	X	
2. Knowledge of economic and enterprise systems.	Mike	1st semester 1994-95		X	
3. Consider profit-sharing, incentives, scholarships, payroll, stock.	VALP Team, Board		Marcia / business & community experts and mentors		

Figure 2.1, continued

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
4. Seek and obtain sponsorship (WMC, NSP, PIC, WFB, Local Business).	Marcia		Marcia / business & community experts / mentors		
5. 504 III C - Nonprofit corporation, tax-exemption.	Marcia / Tony / VALP Team / student	Nov. 1994	Ditto		
6. Writing a business plan.	Dick / Joe		Junior Achievement / Dick's manual	X	
7. Risk assessment and insurance.	Lisa			X	
8. Credit limits and collection periods.	Jane / Dick			X	
9. Install phone line and cordless phone.	Don / phone company	Aug. 1994		X	
10. Develop sales agreement; contract reviewed by legal counsel.	Marcia / Shirley	July 1994; Aug. 1994	Board approval needed		
11. Install Internet and e-mail.	Tony / Joslin	July 1994			

Figure 2.1, continued

1. **Tasks** A. **Activities required to achieve each task** B.	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
D. Marketing / Sales.					
1. Review survey.	Tony / Bill		Software surveys		X
2. Develop advertising scheme.	Jackie / Joe			X	
3. Graphic design of trademark.	Dick / Jackie			X	
4. Design sales brochure.	Jackie / Joe			X	
5. Letter writing to make contact and promote sales.	Bill / Joe				X
6. Follow-up letters (PR-customer focus).	Bill / Joe				X
7. Business cards.	Jackie / Dick / Joe		Cloverdale Printing, Ladysmith	X	
8. Business mentor(s) advisory council (AFL-CIO). • Dan Etton (L & N, Weyerhaeuser) • Association of Retired Executives • Bill Hablieb • Private Industry Council • Community Club	Marcia / Barb L. / Shirley / VALP Team / Linda Cate		Business Day?	X	
9. Publicity.	Bill / Barb L. / Rusty / Marcia				X

Figure 2.1, continued

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
10. Marketing strategies.	Tony / Dick		Linda Cate / WITC / JA / Sue Masterson	X	
E. Production.					
1. Bids on kiln, kiln frames.	Dick	June 1994			X
2. Transportation of base for kiln.	Dick				X
3. Transportation of kilns.	Dick				X
4. Purchase of materials.	Dick		District P.O.'s		X
5. Establish work teams.	VALP Team / Lisa	July 1994			X
6. TQM concepts.	Barb / Ron	July 1994			X
7. Assembling kilns.	Dick			X	
8. Drying product.	Dick			X	
9. Transporting product.	?				X
10. Wiring.	Dick / Don				X
11. Land lay-out.	Barb / Don / Rusty / Marcia	Aug. 1994			
12. Fencing around kilns.	Dick / Don	Sept. 1994			

Figure 2.1, continued

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Videotape	
				Yes	No
F. Human Relations.					
1. Interviewing skills.	Joslin / Lisa / Celeste / Ron			X	
2. Writing resumes.	Celeste / Jodar / Ron				
3. Development of job descriptions, work expectations, and ADA requirements.	Ron				
4. Completing applications.	Joslin / Ron				
5. Inclusion of PIC Work Maturity Competencies.					
6. Safety programs.	Rusty / Don / Dick / Janet / Lisa			X	
7. Employer-community relations and communications (public relations).	Barb L. / Gary				
8. Cooperative learning / TQM.	All staff / administrator / principal				
9. Suggest students take "Psychology of Human Relations" course.	Joslin			X	

Figure 2.1, continued

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**
Perkins Special Populations At-risk - 15% LEP - 5% G/T - 25% EEN - 15% Students representing special populations may need additional support in and outside the integrated classroom experiences. To maintain a rigorous curriculum with a clear concentration on student outcomes, the following task and activities will be implemented: **Task:** Student support, assistance, and interventions. **Activities:**			
1. Establish tutoring program by individual or group.	Celeste / Linda		
2. Establish resource center (tools, aids, learning labs).	Linda / Celeste / Dick		
3. Teach mentoring (homeroom concept blended with portfolio concept).	Lorkowski / Joslin		
4. Employer mentoring.	Lorkowski / Joslin		Business
5. Increase cooperative learning strategies and teaching strategies based on multiple intelligences.	ALL		
6. Include foreign exchange students (LEP) in introduction to business plan.	ALL		
7. Include vocational teachers in IEP planning.	Joslin		Copies of IEP's

Curricula Outlines

Course: Family and Consumer Education III **Grade(s):** 9-12
Content Segment: Team Building/Work Teams
Time Allocation: Seven class periods
Integration Focus: Family and Consumer Education, Technology Education
Wisconsin Learner Outcomes: # 4, 8, 10, 11
Instructional Objectives/Content:
To identify ways to establish work teams.
To understand the significance of team building/working as a team.
To develop effective team building skills.
To analyze effectiveness of teams.

Students learned the importance of working together as a team.

Student Evaluation Procedures:
Team Building Evaluation form.
Team Building Skills (worksheet).
Story about how teams illustrated positive/negative (productive/nonproductive) team building skills.
Resources:
"Teamwork in the Changing Workplace" (video) — optional
Lost on the Moon activity
"Team Up to Unmask Potato Secrets" (curriculum guide), Wisconsin Potato Growers Auxiliary, Inc., Box 327, Antigo, WI 54409

Day 1

- Discuss ways people are put into teams/groups example: numbering off, drawing straws, etc.
- What was fair/unfair about each of the methods of team selection?
  - no choice in team members
  - no designated leader
  - work with people you may not choose
  - skills may not be complementary, etc.
- What is the importance of forming teams?
  - members need to feel valued, this leads to motivation in work
  - sense of fairness
  - members need to feel ownership and empowerment
  - allows people to work cooperatively, etc.
- Why the focus in team building?
  - one of the current challenges in the American workplace is how to deliver the best product or service in the most cost-effective way
  - teamwork is a strategy that works in different areas of industry
- How does a business succeed?
  - eliminates defects or problems before the product or service reaches the customer (quality control and customer service)
  - finds more efficient ways of completing a task (generating ideas)
  - creates environment where workers feel valued for their efforts, are happy to come to work, and have opportunities to learn
  - companies redesigning workforces to share responsibility and leadership
  - team approach strengthens company-committed workers are more likely to do their best work
- With these thoughts in mind, brainstorm on connection between teams in a company, in a class, or in a family.

One of the current challenges in the American workplace is how to deliver the best product or service in the most cost-effective way.

Day 2

- View video "Teamwork in the Changing Workplace," which illustrates examples of how teamwork can help a business succeed.
- Students answer questions while viewing:
  - In each case, who benefits from teamwork and how?
  - According to the employees, how does teamwork feel?
  - If we are to experience similar success with teamwork in class and in our families, who will benefit and how?
- Give one example for each (in class and in your family):
  - What kinds of experiences will you and your team need in order to experience similar positive feelings about teamwork?

Day 3

- Brainstorm as a class, what characteristics a team member might have. Possible qualities might include: patience, tolerance, skills, flexibility, ability to delegate, good listener, trustworthy, initiative, fair, peacemaker/mediator, objective, common sense, respectful, open-minded, good communicator, considerate, cooperative, polite, reliable, punctual, empathetic and a leader.
- Share a list of essential characteristics in the workplace as identified by business and industry.
- Each student identifies the two characteristics he/she possess and would bring to a team, and writes them on a slip of paper with his/her name.
- Students work in groups to establish teams they believe will work well together using only the qualities students have identified they possess (students will not know the names that go with their characteristics).
- After groups have decided on teams, briefly state why/how each of these teams will work effectively.

Students shared a list of essential characteristics in the workplace as identified by business and industry.

Day 4

- Each team will complete the "Lost on the Moon" activity. First work individually and then as a group. When completed, share NASA's results. Discuss how group arrived at consensus or why the group could not.
- Based on activity, is there a need to change any part of the teams because of personality conflicts, etc.?
- Group evaluation—Using essential characteristics in the workplace as a guide, write an example of how your group used or didn't use at least four of the characteristics. What does the team and how can team work toward more effectiveness?

Day 5

- To practice being part of a team, plan for a team building lab by selecting a recipe.
- Complete Worksheet A—Student Work Plan.

Day 6

- Complete chosen lab.
- Each student completes "Team Building Lab Evaluation" form (Worksheet B). Include in the evaluation how did each team member contribute to the total effectiveness of the team?

Day 7

- Discuss evaluation forms.

- What team building skills were demonstrated and essential to the success of teams in business, classes, and families? (groups write an overhead)
- Complete team building overhead.

□□□

Course: Family and Consumer Education II **Grade(s):** 10
Content Segment: Risk Assessment/Insurance
Time Allocation: Five to seven class periods
Integration Focus: Family and Consumer Education, Technology Education, Math, Business Education
Wisconsin Learner Outcomes: # 1, 2, 3, 6, 8, 12
Instructional Objectives/Content:
To understand terminology in insurance policies.
To evaluate different types of insurance for benefits, cost efficiency, etc.
To select an insurance policy that fits the needs of Blue Hills Manufacturing Partnership.
To understand the need for insurance.
Student Evaluation Procedures:
Evaluation of different types of insurance for BHMP.
Testing on insurance policies.
Resources:
Local insurance companies and insurance agents
The Confident Consumer (textbook)

Students evaluated and selected an insurance policy that met the needs of BHMP.

□□□

Course: Health **Grade(s):** 9
Content Segment: Safety Programs
Time Allocation: Ten class periods
Integration Focus: Health, Technology Education
Wisconsin Learner Outcomes: # 3, 4, 8, 9, 14
Instructional Objectives/Content:
To incorporate safety practices in work situations.
To assist someone in need of first aid.
To recognize emergency situations and take action.
Student Evaluation Procedures:
Skills tests of first aid and CPR procedures.
Written first aid and CPR tests.
Practices safety precautions in workplace.
Resources:
First Aid and Safety by American Red Cross
American Heart Association

Students learned to incorporate safety practices in the workplace.

□□□

Course: Business Procedures **Grade(s):** 12
Content Segment: Part 1: The Resume as a Marketing Tool
Time Allocation: One class hour

Integration Focus: Business Education and Vocational English and any other course that studies job application skills.
Wisconsin Learner Outcomes: # 1, 6
Instructional Objectives/Content:
Communicate your abilities and assets.
Keep the employer's needs in mind.
Significantly enhance your individual achievements and accomplishments.
Offer employers a sharp, concise, and professional profile of you.
Highlight your credentials and communicate your importance/value to a potential employer.
Provide you with a competitive edge for the changing job market.

Resumes highlight your credentials and communicate your importance and value to a potential employer.

Student Evaluation Procedures:
List two ways you plan to use your resume.
List two reasons why you need a resume.
List the four advantages a resume can provide.
List the two elements of an effective resume.
Resources:
McCabe, J. R., & McCabe, M. L. (1993). *Writing Effective Resumes: A Complete Guide*. Cincinnati, OH: South-Western Publishing Co.
WordPerfect software
WordStar software

❑❑❑

Course: Business Procedures **Grade(s):** 12
Content Segment: Part 2: What Is in a Resume?
Time Allocation: Two class hours
Integration Focus: Business Education, Vocational English, and any other course that studies job application skills.
Wisconsin Learner Outcomes: # 3
Instructional Objectives/Content:
Define and write a targeted and generic objective.
Draft a summary statement.
List his or her professional experience, education, affiliations, activities, awards/honors, and licenses/certifications.
Explain the use of references and identify three (3) references.
Prepare a shell sketch of his/her resume.

Students explored at least three potential career fields.

Student Evaluation Procedures:
Consider three potential job titles.
Choose three career fields.
Write work history descriptions.
Write short-form qualifications.
List your current and previous jobs.
List all education.
List affiliations if any.
List awards and honors.
List three people for references.
Prepare a resume.

Resources:

McCabe, J. R., & McCabe, M. L. (1993). *Writing Effective Resumes: A Complete Guide*. Cincinnati, OH: South-Western Publishing Co.
WordPerfect software
WordStar software

❑❑❑

Course: Business Procedures **Grade(s):** 12
Content Segment: Part 3: Selecting a Resume Format
Time Allocation: Two class hours
Integration Focus: Business Education and Vocational English and any other course that studies job application skills.
Wisconsin Learner Outcomes: # 5

Students selected the resume format that suited their individualized needs.

Instructional Objectives/Content:

Define a sequential resume and explain its use.
Define an achievement-oriented resume and explain its use.
Define a short-form resume and explain its use.
Select an appropriate resume format.

Student Evaluation Procedures:

Match resume formats with corresponding characteristics.
Select the resume format that suits your needs.

Resources:

McCabe, J. R., & McCabe, M. L. (1993). *Writing Effective Resumes: A Complete Guide*. Cincinnati, OH: South-Western Publishing Co.
WordPerfect software
WordStar software

❑❑❑

Course: Business Education **Grade(s):** 12
Content Segment: Part 4: Personalizing Your Resume
Time Allocation: Two or three class hours
Integration Focus: Business Education and Vocational English and any other course that studies job application skills.
Wisconsin Learner Outcomes: # 6

Transferable skills are highlighted in a functional resume.

Instructional Objectives/Content:

Define and recognize transferable skills.
List principal skill areas and write action statements.
Identify jobs you have held that relate to your career objective.
Present your job responsibilities, highlighting your transferable skills.
Select and list various options for creating your resume.
Explain how to achieve a professional resume image.
Prepare a final draft of your resume.

Student Evaluation Procedures:

Write action statements from list of principal skill areas.
Make a chronological list of jobs you have held.
Examine job responsibilities listed for each position.

Select options to use with your resume.
Prepare a final draft of your resume.

Resources:

McCabe, J. R., & McCabe, M. L. (1993). *Writing Effective Resumes: A Complete Guide.* Cincinnati, OH: South-Western Publishing Co.
WordPerfect software
WordStar software

* * *

Writing an effective cover letter is a must.

Course: Business Education **Grade(s):** 12
Content Segment: Part 5: Marketing Your Resume
Time Allocation: Three class hours
Integration Focus: Business Education and Vocational English and any other course that studies job application skills.
Wisconsin Learner Outcomes: # 8
Instructional Objectives/Content:

Define and explain the use of a cover letter.
List the elements of an effective cover letter.
Write a cover letter.

Student Evaluation Procedures:

Write the first paragraph of a cover letter.
Write the middle paragraph of a cover letter.
Write the final paragraph of a cover letter.
Clip two job advertisements and draft a cover letter to each.

Resources:

McCabe, J. R., & McCabe, M. L. (1993). *Writing Effective Resumes: A Complete Guide.* Cincinnati, OH: South-Western Publishing Co.
WordPerfect software
WordStar software

* * *

The Production Manager chose a Quality Control Officer to help coordinate all production groups, develop methods for quality record keeping, and develop quality control methods

Course: Technology Education **Grade(s):** 10-12
Content Segment: Production
Time Allocation: Ongoing—nine weeks
Integration Focus: Quality Control of Kiln Construction
Wisconsin Learner Outcomes: # 1, 3, 5, 6, 9, 11
Instructional Objectives/Content:

Students will work in groups of three or four with the Production Manager to design and develop processes for construction of the basic kiln structure.
The Production Manager will choose a Quality Control Officer (QCO) to help coordinate all production groups, develop methods for quality record keeping, and develop quality control methods that will assure that accurate construction is achieved at all phases.
Each group will be responsible for keeping daily records of every section that is worked on.
These records will be checked by the QCO and the results passed on to the Production Manager weekly.

The Production Manager is responsible for all quality control in this phase of the operation.

Student Evaluation Procedures:

Accurate assembly

Comments:

This process is the key to operation of the finished kiln.

The choice of QCO will determine good or bad decision-making skills.

Resources:

Applied Economics Study Guide (1993). Colorado Springs, CO: Junior Achievement Inc.

☐☐☐

Course: Technology Education **Grade(s):** 10-12

Content Segment: Production

Time Allocation: Ongoing—nine weeks

Integration Focus: Production of Basic Kiln Frame

Wisconsin Learner Outcomes: # 1, 3, 4, 5, 6, 7, 8, 9, 10, 11

Instructional Objectives/Content:

The Production Manager will choose a Production Team Leader (PTL).

This PTL will develop a production plan worksheet with a work-time schedule and materials list for the basic frame construction (p. 232 Junior Achievement manual).

All materials will be inspected and sorted upon delivery.

The PTL will assign production teams of three or four students to work on the various phases of construction, inspection, and planning.

The PTL will also be responsible for training the various teams and the evaluation of blueprints.

All members of all teams should be able to read and work with the blueprints. Each team should develop a method or process which will increase productivity and quality.

The production team learned to read and work with blueprints.

Student Evaluation Procedures:

Ongoing construction of the kilns.

Comments:

The Production Manager will determine the schedule for reports from the Production Team Leader.

Resources:

Applied Economics Study Guide (1993). Colorado Springs, CO: Junior Achievement Inc.

☐☐☐

Course: Technology Education **Grade(s):** 10-12

Content Segment: Production

Time Allocation: One to two hours

Integration Focus: Letter Quality and Content

Wisconsin Learner Outcomes: # 1, 4, 7, 10

Instructional Objectives/Content:

Students will each choose one politician from Wisconsin or another at the federal level and compose a quality letter (on the computer) explaining which grant we received and what these federal funds are being used for in our school district.

Students will explain in clear, concise detail what her/his job is in the student company and how it relates to the overall project.

A copy of each letter will be handed in for a grade and proofreading by a group of qualified students.

These letters will then be mailed to the various representatives.

Students composed letters explaining the grant, its impact on the school, and sent them to state and federal politicians.

❑❑❑

Course: Technology Education **Grade(s):** 11-12
Content Segment: Production
Time Allocation: Two hours
Integration Focus: Communication/Research/Composition
Wisconsin Learner Outcomes: # 1, 3
Instructional Objectives/Content:

Students in the production phase of the grant will develop a job performance evaluation form. This form will be used by the student as if he/she were the president of this company. The form must cover nine weeks of employment for an employee. In this case, we will use the production portion of the process.

Information provided on each form will be used to determine if an employee is working up to potential, contributing to the project in a positive manner, making a profit for the company, etc.

A list should be developed with items that you feel are important to the success of the company.

A self-evaluation portion of the form may also be developed so that employees may evaluate themselves.

Another option would be to develop a method for improving the employee's performance or determining if termination is the only option.

Student Evaluation Procedures:

Quality, completeness, composition of the Job Evaluation Form.

Resources:

Department of Public Instruction, Wisconsin Technical College System, 1994 Applied Curricula Conference, University of Wisconsin-Stout, Center for Vocational Technology & Adult Education.

Students in the production phase of the grant developed a job performance evaluation form.

❑❑❑

Course: Technology Education **Grade(s):** 11-12
Content Segment: Production
Time Allocation: Two to four hours
Integration Focus: Wisconsin Indianhead Technical College, Wood Technologies, Local Business, Career Information, Department of Natural Resources
Wisconsin Learner Outcomes: # 1, 3, 7, 8, 16
Instructional Objectives/Content:

Students in the production phase of the kiln construction will be visited by members of the local community, the Wisconsin Indianhead Technical College, the Wisconsin Department of Natural Resources and the guidance counselor relating to careers in the fields related to wood products or entrepreneurship.

The Production Manager will assign students to write to the various people involved and coordinate with the school administrators regarding dates and times.

Students will also be required to write a one-page report on the presentations and what was of interest to each individual.

Student Evaluation Procedures:

Written report

Guest speakers informed students about careers related to wood products or entrepreneurship.

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Course: Ecology **Grade(s):** 11-12

Content Segment: Legal Descriptions

Time Allocation: 2 days

Integration Focus: Science, Math, Consumer Education

Wisconsin Learner Outcomes: # 8, 9, 10, 14

Instructional Objectives/Content:

Students will read, interpret, and write legal descriptions properly.

Students will determine acreage of given legal descriptions.

Students will calculate linear distances of given legal descriptions in feet.

Students will identify relationship between section, range and township.

Student Evaluation Procedures:

Student evaluation will be based on competencies attained on several legal description exercises.

A short quiz will also be used to evaluate student understanding.

Comments:

Students will determine legal descriptions of their family's, friends', and relatives' property.

Students will also be expected to find the owner of a given legal description using a plat book.

Resources:

Plat maps

Overhead of a plat map

Plat maps were used to determine acreage and linear distances of legal descriptions.

□□□

Course: Ecology **Grade(s):** 11-12

Content Segment: Distance and Direction

Time Allocation: Three days

Integration Focus: Science, Math

Wisconsin Learner Outcomes: # 3, 4, 8, 9, 10, 11, 13

Instructional Objectives/Content:

Students will identify relationship between feet, chains, miles and acres.

Students will determine individual pace for measuring distance in the field.

Students will convert azimuth readings to bearing and bearing readings to azimuth.

Students will read and interpret a topographical map.

Students will locate specific sites in the field using pacing, orienteering and map reading skills.

Student Evaluation Procedures:

Student evaluation will be based on competencies attained on measurement and compass reading skills.

Students will also be evaluated on their ability to find a specific site in a field setting.

Comments:

Students will learn their pace for 66 feet (1 chain) and 100 feet.

Specific sites for orienteering skills will be in school forest locations which will later be use to do a forest inventory.

Resources:

compasses
tape measures
topographical maps
field trip to forest site

Students learned to locate specific sites in the field using pacing, orienteering, and map reading skills.

* * *

Course: Ecology **Grade(s):** 11-12
Content Segment: Forest measurement devices
Time Allocation: Three days
Integration Focus: Science, Math, Art
Wisconsin Learner Outcomes: # 4, 6, 8, 9, 11

Instructional Objectives/Content:

Students will plan, design and construct a Biltmore stick for measuring tree diameters.

Students will plan, design and construct an altimeter for measuring tree heights.

Students will implement their constructed measuring devices to accurately determine tree heights and diameters in the field.

Student Evaluation Procedures:

Student evaluation will be based on the quality of construction of their measurement devices.

Students will also be evaluated on their ability to use the devices in a forest setting.

Comments:

Students will use constructed devices to do a forest inventory at a school forest site.

Resources:

1" by 1" wood stick 30" long
small protractors
string
trigonometric functions table

Biltmore sticks and altimeters were constructed for measuring tree diameters and heights.

* * *

Course: Ecology **Grade(s):** 11-12
Content Segment: Forest Inventory
Time Allocation: Eight days
Integration Focus: Science, Math, Art
Wisconsin Learner Outcomes: # 3, 4

Instructional Objectives/Content:

Students will use topographical maps to determine specific sites to inventory within a school forest site.

Students will inventory each specific site including tree species present, height, diameter, and crown class.

Students will tabulate data collected and use to form stand graphs for the school forest.

Students will calculate amount of board feet of saw timber and amount of pulpwood present based on forest inventory.

Students will construct a map of the school forest site detailing specific stands and size.

Weyerhaeuser Area School District owns over 300 acres of school forest.

Student Evaluation Procedures:

Student evaluation will be based on student participation in conducting the forest inventory.

Students will also be evaluated on the quality and accuracy of the stand graphs, wood volume calculations and forest maps.

Comments:

Students will identify specific inventory sites when learning to use compass and orienteering skills.

Students will use constructed measuring devices when completing inventory.

Resources:

measuring devices
topographical maps
tree identification guides

* * *

Course: Ecology **Grade(s):** 11-12
Content Segment: Forest Use Conflicts
Time Allocation: Five days
Integration Focus: Science, Social Studies, English, Art
Wisconsin Learner Outcomes: # 3, 5, 9, 11, 12, 14,

Instructional Objectives/Content:

Students will debate the use of school forest sites as sources of wood for the solar dry kilns.

Students will investigate past forest land use policies of state and educational agencies, and compare them to present day policies.

Students will plan, design, and develop posters and/or flyers which will inform the general public of the specific forest use conflict.

Students will write a position paper defending their stand on the forest use issue.

Students debated the use of school forest sites as sources of wood for the solar dry kilns.

Student Evaluation Procedures:

Student evaluation will be based on participation and performance in classroom discussion and debate on forest use issue.

Students will also be evaluated on quality of posters and flyers, as well as their position papers.

Comments:

This unit will be used as a base for a larger unit on land use patterns and conflicts.

Resources:

Department of Natural Resources and Forest Service management plans and policies.

tagboard

* * *

Course: Art **Grade(s):** 11-12

Content Segment: Graphic Design

Time Allocation: Two weeks

Integration Focus: Designing sales brochure and business cards

Wisconsin Learner Outcomes: # 6, 10, 11

Instructional Objectives/Content:

Students will design a sales brochure and business card that represents our company and focal group.

Students will use the student designed trademark and design the sales brochure and business card.

Students will identify the use and importance of the sales brochure and business cards.

Collect various forms of sales brochures and business cards.

Students will reflect back on the importance of targeting our focal group, and put these ideas to work on with the advertisement scheme.

BHMP recognized the importance of creative sales brochures and business cards.

Activities:

In small groups students will list different ways to design the brochure and business cards.

Students will focus on the advertisement scheme and designate different jobs to be completed by class members/advertisement team.

Students will research different printing companies, and find the one that is best suited for our advertisement needs.

Students will create a complete sales brochure and business card, ready for the printer.

Student Evaluation Procedures:

Students will be evaluated on their performance as part of the advertisement team and on the completion of their part on the project.

Resources:

Examples of sales brochures and business cards.

Student design trademark.

Advertisement scheme from classes focused on developing an advertisement scheme.

* * *

Course: Art **Grade(s):** 6-12

Content Segment: Graphic Design

Time Allocation: Seven days

Integration Focus: Graphic design of a Trademark

Wisconsin Learner Outcomes: # 6, 10

Instructional Objectives/Content:

Students will design a trademark fitting the name of our company.

To take a student derived trademark and apply it to the Blue Hills Manufacturing Partnership and its products.

Students will identify the use of a logo or trademark in various companies.

Students will be informed of the contest for creating the trademark and make them aware of the incentives (set up structure outline for contest).

Make students aware of the Blue Hills and what we associate with the Blue Hills and reflect back to known slogans.

Activities:

Show and discuss various trademarks and why companies use them.

Put students in pairs and work on logo and slogan crossword (Junior Achievement, p. 38)

Have students come up with other slogans or sayings not mentioned.

Have students begin to create their slogans for Blue Hills Manufacturing Partnership.

Slogans, trademarks and logos were investigated and studied.

Student Evaluation Procedures:

From student discussion and from activities participated in, along with finished product.

Logo or trademark will be voted on by VALP Team and/or student body.

Resources:

Applied Economics Study Guide (1993). Colorado Springs, CO: Junior Achievement Inc.

Examples of different logos or trademarks.

□□□

Course: Art **Grade(s):** 11-12

Content Segment: Develop Advertising Scheme

Time Allocation: Two weeks

Integration Focus: Develop Advertising Scheme and looking at how various companies chose their advertising scheme.

Wisconsin Learner Outcomes: # 6, 10, 11

Instructional Objectives/Content:

Research styles of advertising to address your focal group.

Brainstorm ideas on what things stick out in your mind about a product and why.

Identify the various ways to advertise and find the one most useful for us.

Chose our source of advertising, design it, and begin to advertise our product.

Lead the discussion on who our focal group is, collect as many different forms of advertising as you can (paper, tapes of commercials on TV and radio) and talk about how they are effective and/or ineffective.

Bring in a person from Jerome Food's Advertising Department.

Advertise, advertise, advertise!

Activities:

In small groups come up with what they liked and disliked about each advertisement.

Make a list of each item that stuck out in their minds and then tell why.

In groups of two or three; each group will create their own advertising scheme for our product and present it in front of the class.

The class will choose the best advertisement; each student will then use that design (idea) and improve on the design as he/she feels necessary.

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Student Evaluation Procedures:

From the students' responses in discussion and performance on class project. Students will pick the best advertising scheme and focus on it as a group until completion of advertisement scheme.

Resources:

Guest speaker from Jerome Food's Advertising Department.
Examples of different advertisements.

◆

Course: Economics—*Launching A Business* **Grade(s):** 11-12
Content Segment: Forms of Business Organization
Time Allocation: Five days; *Launching a Business* will be taught during the fifth week of economics class.
Integration Focus: All subject areas dealing with BHMP.
Wisconsin Learner Outcomes: # 3, 4, 6, 8, 11
Instructional Objectives/Content:

How does the exchange of money for goods and services create a "circular flow" among households, businesses, and government?

Unit I will teach the following concepts:

What is "scarcity" and why must all societies deal with it?
Why is economics sometimes called the study of scarcity and choice?
What are trade-offs and opportunity costs?
Why should everyone understand basic economics?
What are factors of production?
How do different economic systems solve the problem of scarcity?

Unit II will teach the following concepts:

How does the American economic system answer the what, how, and who questions?
Why are private property, the price system, and competition called the "pillars of free enterprise"?
How do profits and other incentives keep the economy moving?
What is the role of government in the American economic system?
How does the exchange of money for goods and services create a "circular flow" among households, businesses, and government?
How are our economic goals used as a yardstick that measures the achievements of the American economic system?

Unit III will teach the following concepts:

What role do prices play in a market economy?
What affects the demand for goods and services in a market economy?
What affects the supply of a particular good or service?
How do price, demand, and supply interact?
How do shifts in demand and supply affect prices?

Unit IV will teach the following concepts:

What are the sources of personal wealth?
How do personal budgets, banks and other financial institutions, consumer credit, and insurance plans help you use your money wisely?
What are some techniques advertisers use to sell their products, and how can you make wise consumer choices?
How do governments and private agencies protect consumers?

Unit VI will teach the following concepts:

How do businesses get the money they need to operate and grow?
How is the cost of borrowing calculated?
How and why do some people trade in stocks and bonds?
How does the government regulate the sale of securities?
How do you read a balance sheet and income statement?

Instructional Objectives/Content:

I. Sole Proprietorship
  A. Advantages
    1. Easiest to organize
    2. Least costly
    3. Owner keeps all profits
    4. Own boss
    5. Minimum legal restrictions
    6. No special taxes
  B. Disadvantages
    1. Unlimited liability
    2. Limited capital
    3. Lack of opportunity for employees
    4. Limited size
    5. Limited ability to grow
    6. Lack of management resources

Partnerships are easy to form and not subject to special taxation.

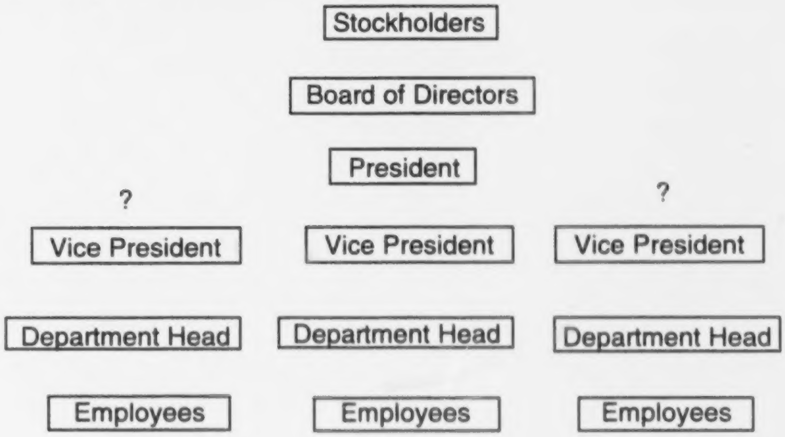
II. Partnership
  A. Advantages over sole proprietorship
    1. Additional funds
    2. Fresh ideas
    3. New talents
    4. Also easy to form and not subject to special taxation
  B. Disadvantages
    1. Partners are individually responsible for all business debts
    2. When one partner dies business is legally terminated
    3. Like sole proprietorship—limited capital
    4. Disagreement can cause conflicts
    5. Share profits

Corporations are difficult and expensive to organize and are subject to special taxes.

III. Corporations
  A. Business organization created under a government charter
  B. Ownership represented by shares of stock
  C. May have many stockholders or a few
  D. Courts treat it as a legal person
    1. It can sue
    2. Can be sued
    3. Enter into contracts
    4. Must pay taxes
  E. Advantages over sole proprietorship and partnership
    1. Limited liability
    2. Ease of transfer
    3. Unlimited life
    4. Tax advantages

F. Disadvantages
  1. Difficult and expensive to organize
  2. Usually requires legal help
  3. Subject to special taxes
  4. Corporations who serve stocks to public give up right of privacy
  5. Profits distributed to all stockholders

G. Organizations of corporations
  1. Obtain a charter
  2. Have a set of rules or bylaws
  3. Organizational chart


Stockholders
Board of Directors
President
?
?
Vice President
Vice President
Vice President
Department Head
Department Head
Department Head
Employees
Employees
Employees

Evaluation of each student's understanding of economics and business was a must for the BHMP.

Student Evaluation Procedures:
Launching a Business Evaluation (test)

Matching

1. board of directors
2. dividends
3. entrepreneur
4. proxy
5. business ethics
6. stockholders
7. franchise
8. unlimited life
9. conspicuous consumption
10. corporation

A. Organizes and manages a business and assumes the risks
B. License allowing a business to operate as if it were a part of larger chain
C. Owners of a corporation
D. Advantage of corporations that allows them to continue when owners leave or die
E. The share of profits distributed to stockholders
F. Buying goods and services to impress others
G. Authorization to vote on behalf of a stockholder
H. Business organization that needs a government charter
I. Standards of conduct for the business community
J. Elected representatives of a corporation's shareholders

Multiple Choice

11. Which statement concerning the forms of business organization is true?
    a. Because they involve so few people, sole proprietorships and partnerships are not true business organizations.
    b. Corporations have many owners called stockholders.
    c. Corporations are better than any other organizational form.
    d. There are no real advantages to any of the three main forms of business organizations.

12. Sole proprietorships are:
    a. Difficult and costly to organize.
    b. The most numerous kind of business organization.
    c. Businesses with more than one owner.
    d. Mostly used by large business organizations.

13. One advantage of a partnership is that
    a. adding partners brings in more capital to the business.
    b. each partner is subject to unlimited liability.
    c. partners get along well together.
    d. the business continues even if one partner dies.

14. A corporation is an "artificial person." This means the corporation
    a. is difficult to organize.
    b. can raise only limited capital.
    c. is the most common form of business organization.
    d. can sue or be sued, enter into contracts, and must pay taxes.

Junior Achievement played an important role in the development of the BHMP.

15. In a large corporation
    a. stockholders run the company.
    b. the board of directors are the owners.
    c. ownership and management are separated.
    d. there is no need to operate under a charter and bylaws.

16. Entrepreneurship is
    a. always profitable.
    b. limited to highly educated adults.
    c. a personality style.
    d. never without risk.

17. Phyllis Stanley recently purchased a store that carries the name of a well-known national ice cream company. Phyllis will buy her equipment and supplies from the company and pay them for using their name. Her business is an example of a
    a. cooperative.
    b. franchise.
    c. not-for-profit corporation.
    d. government-owned corporation.

18. The Girl Scouts are an example of a
    a. cooperative.
    b. franchise.
    c. not-for-profit cooperative.
    d. government-owned corporation.

19. A responsible business firm is concerned with
    a. profits only.
    b. the easiest and fastest way to increase profits.
    c. product quality, consumer safety, product packaging, and product labeling.
    d. reducing production costs even if quality declines.

Comments:

The first six units will be focused toward the forming of a company at Weyerhaeuser High School. Other types of corporations and business organizations will be discussed also.

Resources:

Junior Achievement Inc. (1993). *Applied Economics, Curriculum for High School* (4th ed.). Colorado Springs, CO: Author.

Applied Economics Study Guide (1993). Colorado Springs, CO: Junior Achievement Inc.

* * *

Students interviewed for their positions within the BHMP.

Course: Communication **Grade(s):** 11-12
Content Segment: Interviewing Skills
Time Allocation: Five class periods
Integration Focus: English, Communication
Wisconsin Learner Outcomes: # 1, 8, 10, 16
Instructional Objectives/Content:
To refine interviewing skills
To understand the importance of the interview
To identify skills necessary for successful interviews
To develop questions asked during interviews
To take part in simulated and real job interviews
Student Evaluation Procedures:
Mock interviews
Interview for Blue Hills Manufacturing Partnership
Interview questions developed
Resources:

Junior Achievement Inc. (1993). *Applied Economics, Curriculum for High School* (4th ed.). Colorado Springs, CO: Author.

* * *

Course: English **Grade(s):** 11-12
Content Segment: Marketing
Time Allocation: (1) five days; (2) two to three days
Integration Focus: Letter Writing to Promote Sales and Write Contracts
Instructional Objectives/Content:

Students will learn to write an informative business letter to perspective customers and then write a follow up letter.

Students will learn various types of contracts, uses of contracts, and how to write a business agreement contract.

Teacher Input:

Review the difference of business letters and friendly letters through compare and contrast.

Emphasize that a business letter is concise and to the point.

Point out what other resources should be included with your letter, a business card, brochure, etc.

Type a business envelope including a self-addressed stamped envelope.

Teacher will point out that everything in life is bound with a contract.

Show numerous types of contracts and bring in guest speakers on contracts.

Students learned to write business letters and binding contracts.

Guided Practice:

Write the components of an informative business letter on the board.

Work in partners writing a fictional draft to a prospective client.

Take some of the student drafts and do self and peer analysis of the class letters.

Take some real world contracts and show flaws and consistencies that can pertain to our program.

In small groups write up contracts for prospective clients, do a class review, and whole group critique of each group in the classroom.

Independent Practice:

Each student chooses or is assigned a prospective customer, writes a draft, types the final copy, and sends the letter out.

In partners, write up a contract for an agreed customer that will work with our company.

Student Evaluation Procedures:

The student will successfully send out a business letter and then write a follow up letter.

The student will write a binding contract that is approved by the school lawyer.

□□□

Course: English **Grade(s):** 11-12

Content Segment: Marketing

Time Allocation: Three to four days

Integration Focus: Follow-up Letters (Public Relations, Customer Service)

Instructional Objectives/Content:

Students will understand and appreciate the value and importance of public relations in a company and how to write a follow up call.

The effects of positive PR versus negative PR were discussed.

Teacher Input:

Point out how companies use various types of public relations to keep in touch with their clients.

Point out the effects of positive PR versus negative PR. Discuss how positive PR can cut down on advertising costs and how word of mouth is the best advertising a company can have.

Guided Practice:

Write a letter of appreciation to our customers to follow up a purchase or the chance of doing business with them. Include a business card with the student's signature. Have students write back and forth as a practice activity.

Do class evaluations with one another in a workshop environment.

Independent Practice:

Construct follow-up letters to actual clients to be typed out on a PC.

Do class evaluations with one another in a workshop environment.

Student Evaluation Procedures:

The students will successfully write a follow up letter to the clientele of the company.

* * *

Course: Trigonometry/Pre-Calculus **Grade(s):** 11-12

Content Segment: Graphing Points

Time Allocation: Two class hours

Integration Focus: Graphing Solar Temperature vs. Time Data

Wisconsin Learner Outcomes: # 4

Instructional Objectives/Content:

Have students sketch graphs from the given facts to illustrate the following.
You have to decide on the variables and the relationships involved.
Label your axes carefully, and explain your graphs in words.

- Does your height vary with age?
- Does the amount of dough needed to make a pizza depend upon its diameter?
- Does the amount of daylight we get depend upon the time of year?
- Does the number of people in a supermarket vary during a typical Saturday?
- Does the speed of a pole vaulter vary during a typical jump?
- Does the water level in your bathtub vary before, during and after your bath?

Have students interpret the graphs (handout Interpreting Graphs).

The math instructor was able to use real life situations of temperature variations in the kilns to teach graphing concepts.

Student Evaluation Procedures:

Plotted graph of temperature vs. time data.

Resources:

The Language of Functions and Graphs. Unit A.

* * *

Course: Trigonometry/Pre-Calculus **Grade(s):** 11-12

Content Segment: Comparing and Graphing Inequalities

Time Allocation: One class hour

Integration Focus: Comparing Kiln Costs and Profit

Wisconsin Learner Outcomes: # 3

Instructional Objectives/Content:

Graph and analyze inequalities

Determine optimum point of the inequalities graphed

Student Evaluation Procedures:

Provide report on which type of kiln used will maximize profit.

Resources:

Worksheet : Blue Hills Manufacturing

- Imagine that you are running a small business which dries and sells two kinds of lumber: Model A (16 feet) and Model B (8 feet) (the cheaper version). You are only able to dry up to 360 board feet of either type of lumber in any given week.
- The following table shows all the relevant data concerning the employees at your company:

Job Title	Number of people doing this job	Job Description	Pay	Hours worked
Kiln Loader Unloader	10	This job involves putting the lumber into kilns	$10.00 per week	6 hours per week
Inspector	1	This job involves testing the moisture in the lumber	$12.00 per week	6 hours per week

- The next table shows all the relevant data concerning the drying of the lumber.

	MODEL A	MODEL B
Total loading time in man-hours for each board foot	.02	.06
Total inspection and correction time in man-minutes for each board foot	.10	.30
Component costs for each board foot	.06	.6
Selling price for each board foot	.85	.85

Worksheets focused on the BHMP helped students understand the principles of manufacturing costs and profits.

- At the moment, you are drying and selling 100 board feet of Model A and 200 board feet of Model B each week.
  - What profit are you making at the moment?
  - How many of each model should you make in order to improve this situation?
  - Would it help if you were to make some employees redundant?

Worksheet: Blue Hills Manufacturing. . . . Some Hints

- Suppose you dry 100 board feet Model A's and 200 board feet Model B's in one week:
  - How much do you pay in wages?
  - How much do you pay for lumber?
  - What is your weekly income?
  - What profit do you make?
- Now suppose that you manufacture x amount of Model A and y amount of Model B lumber each week. Write down three inequalities involving x and y. These will include:
  - considering the time it takes to load the lumber and the total time that the loaders have available.
  - considering the time it takes to inspect and correct faults in the lumber and the total time the inspectors have available.
- Draw a graph and show the region satisfied by all three inequalities.

- Work out an expression which tells you the profit made on x (Model A) and y (Model B) kilns.
- Which points on your graph maximize your profit?

* * *

Course: Trigonometry/Pre-Calculus **Grade(s):** 11-12
Content Segment: Predicting Outcomes
Time Allocation: Two days
Integration Focus: Using Solar Kiln Temperature Data to Predict Yearly Solar Drying Capability
Wisconsin Learner Outcomes: # 13
Instructional Objectives/Content:
Have students interpret the graph.
Have students be able to complete graphs beyond plotted points.
Have students be able to write, give,.and cosine equations for repeating data curves.
Model equations and find all parts to equation.
Student Evaluation Procedures:
Find values for temperature, A, B, unknowns in model equation.
Resources:
Foresman, S. (1992). *The University of Chicago School Mathematics Project: Pre-Calculus and Discrete Mathematics* (p. 263). Glenview, IL: University of Chicago.

Hours of sunlight and Wisconsin temperatures were used to teach students to predict yearly solar drying capability.

Worksheet: Kiln Temperature

- The graph overleaf shows how the temperature of the kiln varies on a particular Wednesday.
  - Write a paragraph which describes in detail what the graph is saying:
  - When is high/low temperature?
  - When is the temperature level rising/falling?
  - When is the temperature level rising/falling most rapidly?
  - How fast is it rising/falling at this time?
  - What is the average temperature of the kiln?
  - How much does the temperature vary from the average?
- Complete graph to predict how the temperature will vary on Thursday.
- How will the table you draw up for Wednesday need to be adjusted for Thursday? Friday?
- Assuming that the formula which fits this graph is of the form $d = A + B\cos(28t + 166°)$ (Where d = temperature of kiln in degrees Fahrenheit; t = time in hours after midnight on Tuesday night)
- Can you find out the values of A and B?
- How can you do this without substituting in values for t?

* * *

Course: Trigonometry/Pre-Calculus **Grade(s):** 11-12
Content Segment: Costing and Pricing

Time Allocation: Two days
Integration Focus: Blue Hills Manufacturing Wood Boxes
Wisconsin Learner Outcomes: # 3
Instructional Objectives/Content:

Develop relationships between products produced and cost and time involved.
Determine cost of product.
Determine quantity sold by market analysis.
Determine profit.

Student Evaluation Procedures:

Student must provide a report on cost of product, number produced, number sold, and profit.

Resources:

Foresman, S. (1992). *The University of Chicago School Mathematics Project: Pre-Calculus and Discrete Mathematics.* Glenview, IL: University of Chicago.
Worksheet: Producing a Wood Box

Worksheet: Producing a Wood Box

- A group of bored, penniless teenagers want to make some money by producing and selling their own homemade box. A sympathetic teacher offers to supply duplicating facilities and wood free of charge, at least for the first few boxes.
- Make a list of all the important decisions they must make. Here are three to start you off:

Students identified the relationships between products produced and cost and time involved.

How big should the boxes be?	(1 board feet)
How many workers will be needed?	(*w* workers)
How long will it take to build?	(*t* hours)

- Many items in your list will depend on other items. For example,
  - For a fixed number of people involved, the bigger the box, the longer it will take to produce.
  - For a fixed size of the box, the more workers there are, etc.
  - Complete the statement, and sketch a graph to illustrate it.
  - Write down other relationships you can find, and sketch graphs in each case.
- The group eventually decides to find out how many potential customers there are within the school, by producing a sample box and conducting a survey of 100 pupils, asking them "Up to how much would you be prepared to pay for this box?" Their data are shown below:

Selling price (*s* dollars)	Nothing	10	20	30	40
Number prepared to pay this price (*n* people)	100	82	58	40	18

- How much should they sell the box for in order to maximize their profit?
- After a few sales, the teacher decides that he will have to charge the pupils 10*p* per box for wood and duplicating machinery.
- How much should they sell the box for now?

Worksheet: Producing Wood Boxes . . . Some Hints

- Here is a more complete list of the important factors that must be taken into account:

- Who is the box for?	(school friends?)
- What should it be about?	(cards, puzzles, jokes, etc.)
- How big should it be?	(1 board feet)
- How many workers will it need?	(w workers)
- How long will it take to build?	(t hours)
- How many people will buy it?	(n people)
- What should we fix the selling price at?	(s dollars)
- How much profit will we make altogether?	(p dollars)
- How much should we spend on advertising	(a dollars)

- Can you think of any important factors that are still missing?
- Sketch graphs to show how: t depends on w; w depends on 1; n depends on s; p depends on s; n depends on a. Explain the shape of each of your graphs in words.
- Draw a graph of the information given in the table of data.
- Explain the shape of the graph.
- What kind of relationship is this? (Can you find an approximate formula which relates n to s?)
- From this data, draw up a table of values and a graph to show how the profit (p dollars) depends on the selling price (s dollars).
- Use your graph to find the selling price which maximizes the profit made.
- Each box costs $10p$ to produce. Suppose we fix the selling price at $20p$.
  - How many people will buy the box?
  - How much money will be raised by selling the box (the "revenue")?
  - How much will these boxes cost to produce?
  - How much actual profit will therefore be made?
- Draw up a table of data which shows how the revenue, production costs and profit all vary with the selling price of the box.
- Draw a graph from your table and use it to decide on the best selling price for the box.

Students learned that a lot of information was required to determine manufacturing decisions.

* * *

Course: Trigonometry/Pre-Calculus **Grade(s):** 11-12
Content Segment: Math Modeling of Data
Time Allocation: Two class hours
Integration Focus: Modeling Equation to Solar Temperature vs. Time Data
Wisconsin Learner Outcomes: # 11
Instructional Objectives/Content:

Construct best fit line for plotted data. (Do example 1, then actual temperature vs. time).

Review equation of a straight line, sine and cosine curve.

$y = mx + b$ and $y = A + B \cos (Ct - D)$

Have students test equation for reliability by interpolating points and matching results with existing data points.

Student Evaluation Procedures:

Model equation for temperature-time data.

Resources:

Is Height Hereditary? Handout of activity.

Accommodations for Students with Special Needs

All juniors and seniors are involved with the Blue Hills Manufacturing Partnership including students with exceptional educational needs. In fact, one student classified as learning disabled and at-risk, was "hired" into a management position within the BHMP. Individualized Educational Program Plans (IEPs) were developed by Ms. Celeste Murray, Special Education Teacher (K-12), to identify and address the individual needs of students. A sample of an IEP is shown in *Figure 2.2, Individualized Education Plan.* All students are mainstreamed into regular education classes at Weyerhaeuser. Students come to Ms. Murray's resource room during their study halls for special assistance. She also consults with the regular education teachers to assist in the adaptation or modification of course assignments. Some students schedule test taking in the resource room.

All juniors and seniors are involved with the Blue Hills Manufacturing Partnership including students with exceptional educational needs.

Figure 2.3, Content Mastery Modification Plan is a form that Ms. Murray uses to communicate the modification needs of a student to the regular education teachers. After completing the form, she meets with the teachers to discuss the students' needs and any grade modifications that may be required. Another communication tool that Ms. Murray utilized is shown in *Figure 2.4, Student - Class Performance Rating Form.* This form was given to the regular education teachers so that she could obtain feedback regarding student performance in the regular education classroom.

Ms. Murray addressed the personal-social skills competency areas for her students using a resource entitled *Life Centered Career Education* by Donn E. Brolin, 1992, Reston, VA: The Council for Exceptional Children.

(Text continued on page 60)

▲ *Aaron Kraczek (front) and Brandon Wright spray kiln fans with black paint to attract more solar heat.* ▲

Ms. Murray addressed the personal-social skills competency areas for her students using a resource entitled Life Centered Career Education.

Figure 2.2

Weyerhaeuser Area School District Individualized Education Program

Student Name: "John Doe"
Date of Birth: 02/25/76
Gender: Male
Grade: 12.1
Race/Ethnic (if parents choose to identify): N/A
Parent or Legal Guardian: "Mr. John Doe"
2nd Street
Weyerhaeuser, WI 54895
No telephone
District of Placement: Weyerhaeuser

Amount of special education: (percentage of time or amount of time)
10–18% = 30–60 minutes per day.

Extent to which student will participate in regular education programs:
All areas of the curriculum with monitoring.

Relates Services: (Include specific amount of service)

Physical Education	☒Regular	☐Specially designed
Vocational Education	☒Regular	☐Specially designed

Beginning date of IEP: 10-15-94 (mo./day/yr.)
Ending date of IEP: 10-15-95 * (mo./day/yr.)

* Does not include school vacation.

Will student participate in standardized testing?

Third grade reading test	☐Yes	☒No	☐With Modifications	N/A
Competency Based testing	☒Yes	☐No	☐With Modifications	
Achievement Testing	☒Yes	☐No	☐With Modifications	

Justification for removal from regular education or regular education environment:
"John" needs to use the Resource Room for tutoring and curriculum monitoring in all areas of his curriculum. "John" may take all tests in the Resource Room as he feels necessary. "John" needs an area that will keep him focused based on the goals and objectives of this IEP.

IEP meeting participants:

Date of IEP meeting: 08/29/94

LEA Representative:

Special Education Teacher:

Parent/Guardian:

Figure 2.2, continued

Weyerhaeuser Area School District Individualized Education Program

Page 2 of 2

Name of Student "John Doe"

Present Levels of Educational Performance

Woodcock Reading Mastery - R - Total Reading GE 7.4

Annual Goal

"John" will complete the transition to include post-high school activities.

Short-term Objectives	Evaluation		
	Objective Criteria	Procedures	Schedule
"John" will:			
1) Complete all requirements for graduation with passing grades.	100% with appropriate standards	Cumulative records	Yearly
2) Apply to vocational school.	100%	Voc. ed. entrance forms completed and mailed	Semester
3) Pass all classes and turn in assignments on time.	100%	Report forms and report cards	Quarterly
4) Complete a portfolio of past and present accomplishments.	Grades K-12	Cumulative records portfolio	Once

Specific Special Education and Related Services which will Contribute to Meeting this Goal:

EEN Programming and regular classroom.

Action Taken on this Goal at IEP Review:

Figure 2.3

Weyerhaeuser Area School District Content Mastery Modification Plan

Minimum & Moderate Modifications

Pacing:

___ Extend time requirements
___ Allow breaks, vary activity often
___ Omit assignments requiring copying in a timed situation
___ Other: ____________________

Environment:

___Preferential seating
___Alter physical room arrangement
___Define limits (physical, behavioral)
___Minimize distractions:
    ___ Visual ___ Auditory ___Both
___Other: ____________________

Presentation of Subject Matter:

___Emphasize teaching approach:
    ___ Auditory ___Visual
    ___Tactile ___Multisensory
___Individual or small group instruction
___Tape lectures for replay
___Present demonstrations
___Use manipulatives
___Emphasize critical information

Materials:

___Tapes texts, stories, worksheets
___Highlighted texts, study guides
___Use supplementary materials
___Notetaking assistance: copy notes of regular student
___Type handwritten teacher materials
___Special equipment
___Use of laminated materials
___Use of calculator or computer

Note: Minimum and moderate modifications should not affect grading. Maximum modifications may require a modified grade.

Test Adaptations:

___Oral
___Taped
___Read test for student
___Modify format
___Shorten length
___Other: ____________________
___Short answer
___Multiple choice

Assignments:

___Give directions in small, distinct steps
___Allow copying from paper or book
___Lower difficulty level
___Shorten assignment
___Reduce paper and pencil tasks
___Read directions to student
___Give oral cues or prompts
___Record or type assignments
___Adapt worksheets, packets
___Maintain assignment notebook
___Avoid penalizing for spelling errors
___Others: ____________________

Reinforcement:

___Positives reinforcement
___Concrete reinforcement
___Check often for understanding and review
___Peer tutoring
___Request parent help
___Have student repeat directions
___Use vocabulary files
___Teach study skills
___Use study sheets to organize material
___Reinforce long term assignment timelines
___Use behavioral contracts
___Other: ____________________

Maximum Modifications:
___Use specialized curriculum
___Use adapted or simplified texts
___Use modified grades

Figure 2.4

Weyerhaeuser Area School District Student-Class Performance Rating Form

Teacher: ______________________ **Date:** __________

Student: ______________________ **Class:** __________

Concern exists regarding the educational progress of the above named student. We would like to know more about the student's present performance in class. Please complete the evaluation items below and return this form to ______________________ by __________. Thank you.

Academic Performance

☐ All work is current

☐ Class participation is good

☐ Steady or improving grades

☐ Declining quality of work

☐ Declining grades being earned

☐ Incomplete work

☐ Academic failure

☐ Other. Please explain

____

If you had to give the student a grade the student would receive a __________ .

Classroom Conduct

☐ Disruptive in class

☐ Inattentive in class

☐ Lack of concentration

☐ Lack of motivation

☐ Sleeping in class

☐ Extremely negative in attitude

☐ Defiance; breaking rules

☐ Frequently needs discipline

☐ Verbally abusive to others

☐ Sudden outbursts of temper

☐ Frequent visits to the nurse, counselor

☐ Frequent visits to the lavatory

☐ Hyperactivity; nervousness

☐ Other. Please explain

____

____

Other School Conduct

☐ Unexcused absences from school

☐ Tardiness

☐ Frequent disciplinary referrals

☐ Frequent excused absenteeism

☐ Suspensions

What curricular modifications have you recently made to meet the needs of the student?
Other comments?

Operating Agreement

One of the first major tasks that the board of directors, officers, and consulting VALP team needed to accomplish was to develop an operating agreement for the Blue Hills Manufacturing Partnership, LLC. A local attorney, Mr. Arnold R. Koehler donated both his time and expertise to assist in this monumental process. The students worked very hard during the fall semester to develop this document with Mr. Koehler's guidance. Although the following does not include the table of contents or signature pages, it details the operating practices of the BHMP.

One of the first major tasks that the board of directors, officers, and consulting VALP team needed to accomplish was to develop an operating agreement for the Blue Hills Manufacturing Partnership, LLC.

Prefatory Statement

This Operating Agreement is made and entered into as of January, 1995, by and between members of Blue Hills Manufacturing Partnership, a Wisconsin Limited Liability Company, (the "Members") for the purposes of providing the rights, obligations, and restrictions as set forth in this Operating Agreement with the force and effect of an operating agreement as provided for in the Wisconsin Limited Liability Company Law (the "WLLCL"), and Heidi Rouleau (the "Organizer"), solely for the purpose of making the acknowledgment at the end of this Operating Agreement.

In consideration of the mutual promises made in this Operating Agreement, the parties agree to manage and operate the Company pursuant to this Operating Agreement as follows:

Article 1: General Provisions

Section 1.1. Name

The name of the Company is Blue Hills Manufacturing Partnership, a Limited Liability Company.

Section 1.2. Registered Office and Agent

(a) Initial Office and Agent. The principal place of business of the Company and the Company's Registered Office shall initially be County Highway F at Culver Avenue, P.O. Box 1000, Weyerhaeuser, Wisconsin, 54895 and the Company's Registered Agent shall be the Secretary of the Board of Directors of the Company (as defined in Section 5.2 below)

(b) Changes. A subsequent Secretary of the Board of Directors shall be the new Registered Agent and shall change the Registered Office, if appropriate, if the then-current Secretary of the Board of Directors resigns or is removed or the Secretary of the Board of Directors determines to make such an appointment or change.

(c) Filing on Change. Upon the appointment of a new Registered Agent or the change of the Registered Office, the Secretary of the Board of Directors shall file or cause the filing of the document required by section 183.0105 of the WLLCL as appropriate to the circumstances.

The general purpose of the BHMP is the operation of a dry kiln and the sale of the products produced.

Section 1.3. General Purpose

The Company's general purpose is the operation of a dry kiln and the sale of the products produced by said operation, said operation to be controlled and supervised by the members of the junior and senior classes of Frederick Weyerhaeuser High School, Weyerhaeuser, Wisconsin.

Article 2: Capital Interests

Section 2.1. Contributions

The equity of the Company shall be divided into percentage interests (the "Percentage Interests") based on the relative contributions made by the Members of the company, as indicated below:

(a) Share Entitlements. Each member of the 11th and 12th grade classes of the Frederick Weyerhaeuser Senior High School, Weyerhaeuser, Wisconsin, shall be entitled to a one share interest of the total shares by virtue of their membership of said class.

(b) Senior Class Share. The 12th grade class of the Weyerhaeuser High School shall be entitled to membership totaling one for each member of the class that participates in the company.

(c) Junior Class Share. The 11th grade class of the Weyerhaeuser High School shall be entitled to membership shares totaling one for each member of the class that participates in the company.

(d) President—Additional Share Entitlements. In addition to the share in Section 2.1(a), the president of the company is hereinafter shall be entitled to an additional three shares.

(e) Vice President—Additional Share Entitlements. In addition to the share in Section 2.1 (a), the vice-president of the company shall be entitled to an additional three shares.

(f) Board of Directors—Additional Share Entitlements. In addition to the share in Section 2.1 (a), each member of the Board of Directors shall be entitled to an additional two shares.

(g) Team Leader—Additional Share Entitlements. In addition to the share in Section 2.1 (a), each Team Leader shall be entitled to an additional two shares.

(h) Additional Shares Awarded—Honor Roll Attainment. Additional shares shall be awarded to each member in the amount of one quarter of an extra share for the attainment of an A or B Honor Roll for a nine week period.

(i) Loss of Shares—In-school Suspension. Each member is liable to loss one quarter of their membership share for each in-school suspension served. In addition, the class of which that student is a member will also lose one quarter of a share.

(j) Loss of Shares—Out-of-school Suspension. Each member is liable to lose one half of their membership share for any out-of-school suspension served. In addition, the class of which that student is a member will also lose one half of a share.

(k) Limitation of Loss of Class Shares. Once a member loses his or her share or shares, his or her class will not lose additional shares if that member's actions would otherwise mean a loss of shares under Section 2.1(i) or Section 2.1(j).

The equity of the company is divided into percentage interests based on the contributions of members.

Students can earn additional shares for the attainment of an A or B Honor Roll for a nine-week period.

Section 2.2. Additional Capital

(a) Contributions. Inasmuch as all of the capital for the company was derived from a federal grant through Weyerhaeuser School District, no capital contributions need be made the members. Should additional capital be required, said funds will come from third party borrowed funds and/or grants.

(b) Borrowed Funds. Each Member shall be severally liable for his or her pro rated share (based on the Member's Percentage Interest) of (1) any indebtedness of the Company for which recourse may be had by the lender against any Member as a result of a guarantee or similar undertaking and (2) any indebtedness of the Company owed to any Member, regardless of the origins of the indebtedness. If any Member (1) is compelled to make a payment on any indebtedness of the Company in excess of the Member's pro rated share or (2) is unable to collect the entire amount owed to the Member by the Company under any indebtedness to him or her, the other Members shall reimburse the Member entitled to reimbursement upon demand based on their respective prorated shares. The provisions of this Section 2.2(b) may only be enforced by the Member entitled to reimbursement under this Section 2.2(b).

Students do not contribute their own money to the company.

Article 3: Distributions

Section 3.1. Current Distributions

Current distributions shall be Distributed to the Members in proportion to the number of Membership Units held by each in accordance with the following schedule:

(a) To Senior Class Members. Members of the graduating class will receive distributions based on their membership shares up until the first day of the school year following their graduation. At that time, their share shall be distributed and the new Junior class will begin to accrue their share based on the profits of the organization subject to the transfer of the membership provision of Article 6. In determining the distribution to be paid to the graduating Seniors, any money paid to the company within one week of the first school day of the succeeding year shall inure to the benefit of the graduating class and its members and not to the incoming junior class.

(b) To Classes. Membership shares held by the classes shall be paid to the classes two weeks before the senior class trip or May 1st of each year, which ever comes earlier.

Section 3.2. Liquidating Distribution to Members

If the company is liquidated pursuant to Article 8 below, the assets to be Distributed pursuant to Section 8.4 below shall be Distributed to the Members in accordance with their Capital Account balances, after making the adjustments for allocations under Section 3.1 above.

Membership shares held by the classes shall be paid to the classes two weeks before the senior class trip or May 1st of each year, which ever comes earlier.

Article 4: Allocation of Profits and Losses

Section 4.1. Profits and Losses

Except as provided below in this Article 4, items of income, gain, loss, or deduction of the company shall be allocated among the Members in proportion to their Percentage Interests. Such items shall be determined on a daily, monthly, or other basis, as determined by the Managing Member using any permissible method under section 706 of the Code and the Treasury Regulations under that section.

Section 4.2. Tax Allocations

The following special allocations shall be made in the following order:

(a) Imputed Interest. To the extent the Company has interest income or deductions with respect to any obligation of or to a Member pursuant to section 483, sections 1271-1288, or section 7872 of the Code, such interest income or deductions shall be specially allocated to the Member to whom the obligation relates.

(b) Capital Contributions. In accordance with section 704(c) of the Code and the Treasury Regulations under that section, income, gain, loss, or deduction with respect to any capital contribution shall, solely for tax purposes, be allocated among the Members so as to take account of any variation between the adjusted basis of the property to the Company for federal income tax purposes and its value.

(c) Elections. Any elections or other decisions relating to such allocations shall be made by the Managing Member in any manner that reasonably reflects the purpose and intent of this Operating Agreement. Allocations pursuant to this Section 4.2 are solely for purposes of federal, state, and local taxes and shall not affect, or in any way be taken into account in computing, any capital account, share of income, gain, loss, or deduction, or distribution pursuant to any provision of this Operating Agreement.

(d) Income Tax Consequences. The Members are aware of the income tax consequences of the allocations made by this **Article 4** and agree to be bound by the provisions of this **Article 4** in reporting their shares of income and loss for income tax purposes.

Article 5: Management of Company

Section 5.1. Managing Board

Each member of the Managing Board of Directors shall hold office until April 30th of his or her Senior year or until his or her removal or resignation.

(a) Managers. The number of Members of the Managing Board of Directors of the Company shall be seven unless otherwise provided by Majority Consent. The Managing Board of Directors shall be elected and may be removed by Majority Consent. Each member of the Managing Board of Directors shall hold office until April 30th of his or her Senior year or until his or her removal or resignation. Removal may be with or without cause. A Member of the Board of Directors may voluntarily resign at any time by delivering written notice to the Secretary of the Board of Directors or the Company. A resignation is effective when such notice is delivered to the Company unless the notice specifies a later effective date.

(b) Authority and Powers of Managing Board of Directors. The Company's business and affairs shall be managed under the direction of the Managing Board of Directors, and all powers of the company shall be exercised by or under the authority of the Managing Board of Directors as the Members' proxy, including the power to:

(i) establish Reserves and thereafter maintain those Reserves in such amounts as the Managing Board of Directors deems appropriate;

(ii) acquire the Real Estate or any interest in the Real Estate, subdivide, improve, develop, and lease all or any part of the Company's property, including the Real Estate, in a manner consistent with the Company's status as a developer of real estate;

(iii) borrow money and procure temporary, permanent, conventional, or other financing on such terms and conditions, at such rates of interest, and from such parties as is approved and, if security is required for the loan, to mortgage or grant a security interest in any portion of the Company's Real Estate or assets;

(iv) after giving notice to the Members, bring, defend, settle, compromise, or otherwise participate in any actions, proceedings, or investigations, whether at law, in equity, or before any governmental authority or agency, and whether brought against the Company or the Members, arising out of, connected with, or related to the Company's business and affairs or the enforcement or protection of interests in or of the Company;

(v) insure the Company's activities and property;

(vi) enter into agreements with persons for property management services, property improvement or development, other real estate services, and all other contracts or agreements that the Managing Board of Directors deems reasonable, necessary, and consistent with the Company's status as a developer of real estate, and pay from the Company's funds the consideration required under the contracts or agreements;

(vii) pay out of the Company's funds all fees and expenses incurred in the organization and operation of the Company;

(viii) perform any other acts or activities customary or incident to the acquisition and ownership of investment real estate;

(ix) authorize the execution of all documents, instruments, and agreements reasonably deemed by the Managing Board of Directors to be necessary, appropriate, or needed for the performance of its duties and the exercise of its powers under this Operating Agreement, including those relating to obtaining tax incremental financing, if available;

(x) appoint a Registered Agent or change the Registered Office pursuant to Section 1.2 above; and

(xi) retain attorneys, accountants, and other professionals in the course of the performance of the Managing Board of Directors duties and exercise of their powers.

Each Member of the Managing Board of Directors shall be entitled to one vote.

(c) Actions by Managing Board of Directors. Any actions of the Managing Board of Directors shall be taken on the consent of a majority by number of the Managing Board of Directors obtained pursuant to this Section 5.1(c).

(i) Manner of Acting. The Managing Board of Directors' consent to any act or failure to act may be given orally or in writing. Any person alleging that the requisite consent was given has the burden of proving the validity of that consent, except in the case of a written consent unanimously signed by the Members of the Managing Board of Directors. Written records kept pursuant to Section 5.1(c)(ii) below of a meeting at which Managing Board of Directors voted on an issue shall be prima facie proof of such consent, if notice of the issue to be discussed at the meeting was duly given or waived pursuant to Section 5.1(c)(iv) below. Such meetings may be conducted in person, by telephone, or both.

(ii) Records. The Company shall keep written records of all actions taken by the Managing Board of Directors, which records shall be kept and maintained by the Secretary.

(iii) Voting. Each Member of the Managing Board of Directors shall be entitled to one vote. Any Member abstaining from voting on a given issue will be deemed to have voted in the same manner as the majority, if any, of the Members of the Managing Board of Directors not abstaining from voting on that issue.

(iv) Notice. No issue shall be voted on by the Managing Board of Directors unless notice of at least three days before the scheduled meeting unless notice is waived by any Member of the Managing Board of Directors not receiving it. Any person alleging that the requisite notice was given or waived has the burden of proving the validity of the notice or waiver, except in the case of (1) a signed acknowledgment of receipt of notice or (2) a waiver of notice signed by the Member of the Managing Board of Directors not receiving the notice. Written records kept pursuant to Section 5.1(c)(ii) above of a meeting at which a Member appeared shall be prima facie evidence that the Member was duly notified of the issues voted on at the meeting or that the Member waived the requirement of such notice, unless the purpose for the appearance was to contest the validity of notice of such issues.

The Company's Officers shall consist of the President of the company, Vice-President of the company, and the three Team Leaders.

Section 5.2. Officers

(a) Number of Officers. The Company's Officers shall consist of the President of the company, Vice-President of the company, and the three Team Leaders. The Managing Board of Directors may appoint such other officers and assistant officers as it deems necessary or remove said officers or employees upon a vote of all members of the Board of Directors, the President, Vice-President and Team Leaders.

(b) Appointment and Term of Office. The Company's Officers shall serve a term which shall expire at the April 30th of each year unless earlier removed by the Managing Board of Directors and officers with or without cause. Before the expiration of the term of office of those officers not members of the senior class, said officers may re-apply for said position, if not otherwise prohibited by this Operating Agreement.

(c) President shall be a Senior. The President of the company shall be a member of the senior class and shall be appointed by the Board of Directors in May of his/her junior year for a term to expire on April 30th of the following year. The President shall be the Company's principal executive officer and, subject to the Managing Board's control, shall in general supervise and control all of the Company's business and affairs. The President may sign certificates, deeds, mortgages, bonds, contracts, or other instruments that are necessary or proper to be executed in the course of the Company's regular business or are otherwise required by law to be otherwise signed or executed. In addition, the President shall perform all duties incident to the office of president and such other duties as may be prescribed by the Managing Board of Directors from time to time.

The President of the company shall be a member of the senior class and shall be appointed by the Board of Directors in May of his/her junior year for a term to expire on April 30th of the following year.

(d) Vice-President shall be a Junior. In the President's absence or in the event of the President's death, inability, or refusal to act, the Vice-President, shall perform the President's duties, and when so acting, shall have all the powers of and be subject to all the restrictions on the President. The Vice-President shall be a member of the junior class and shall be appointed by the Managing Board of Directors in May preceding his or her entry into the junior year at Weyerhaeuser High School, for a term to expire April 30th of the following year.

(e) Secretary. The Secretary of the company shall be the Secretary of the Managing Board of Directors and shall be nominated and elected by the Board of Directors from one of their members with a term to expire on April 30th of each year. The Secretary shall:

(i) keep the minutes of the proceedings of the Managing Board in one or more books provided for that purpose;

(ii) see that all notices are duly given in accordance with the provisions of Section 5.1(c) (iv) above;

(iii) be custodian of the Company's records;

(iv) when requested or required, authenticate any of the Company's records;

(v) keep a register of each Member's address; and

(vi) in general perform all duties incident to the office of secretary and such other duties as from time to time maybe assigned to the Secretary by the President or the Managing Board.

(f) Treasurer. The Treasurer shall have charge and custody of, and be responsible for, (1) all of the Company's funds and securities; (2) receive and give receipts for moneys due and payable to the Company from any source whatsoever, and deposit all such moneys in the Company's name in such bank; and (3) in general perform all of the duties incident to the office of treasurer.

(g) Team Leaders. Other Officers of the company shall be appointed by the Managing Board of Directors and shall include the Marketing Team Leader, the Production Team Leader, and the Management Team Leader. These positions shall be answerable to the President, Vice-President and the Managing Board of Directors.

The Treasurer shall be responsible for all of the Company's funds and securities.

Section 5.3. Restrictions on Authority of Managing Board and Officers

None of the Managing Board of Directors or the Officers shall have the authority to:

(a) do any act in contravention of applicable law or this Operating Agreement or that would make it impossible to carry on the Company's activities;

(b) possess Company property, or assign rights in specific Company property, for other than a purpose of the Company; or

(c) perform any act that would subject the Members to liability in any jurisdiction except as expressly provided in this Operating Agreement.

Section 5.4. Limitation on Liability of Members of the Managing Board of Directors and Officers; Indemnification

No Member of the Managing Board of Directors or Officer shall be liable, responsible, or accountable in damages or otherwise to the Members or the Company for any act or omission pursuant to the authority granted by this Operating Agreement if the Manager or Officer acted (1) in good faith and in a manner he or she reasonably believed to be within the scope of the authority granted to him or her by this Operating Agreement and (2) in the best interests, or not opposed to the best interests, of the Company, provided that the Member of the Managing Board of Directors or Officer shall not be relieved of liability for any claim, issue, or matter as to which the Members of the Managing Board of Directors or Officer shall have been finally adjudicated to have breached this Section 5.4. Subject to this limitation in the case of any such judgment of liability, the Company shall indemnify or allow expenses to the Members of the Managing Board of Directors and Officers to the fullest extent permitted or required by section 183.0403 of the WLLCL as though they were members of the Company.

Section 5.5. Actions by Members

Actions by Members shall be by written consent signed on behalf of Members holding the requisite Percentage Interests to constitute the threshold of consent necessary to take the subject actions pursuant to this Operating Agreement, provided that both Members shall be given notice of any such consent before the implementation of the action. Any Member in material breach of this Operating Agreement shall not be entitled to vote on any matter unless the breach has been waived by or cured to the reasonable satisfaction of the other Member, and the defaulting Member's Percentage Interest shall not be included in determining whether the requisite threshold of consent has been met. No Member, in its capacity as such, shall have the authority to act for the Company in any matter. This Section 5.5 constitutes a restriction on the Members' management rights and duties to the extent these rights and duties have been delegated to the Managing Board as the Members' proxy.

Section 5.6 Meetings

(a) Annual Meeting of Members. Annual meetings will be held in May of 1995 and August in each succeeding school year. Meetings will be held every two weeks with hours to alternate.

(b) Managing Board of Directors Meetings. Meetings of the Managing Board of Directors shall be held every two weeks with hours to alternate, and upon proper notice under Section 5.1.

Annual meetings were held in May of 1995 and will be held in August in each succeeding school year. Meetings will be held every two weeks with hours to alternate.

Article 6: Transfer of Percentage Interests

Section 6.1. General Restrictions on Transfers

A Member may not sell, give, assign, bequeath, pledge, or otherwise encumber, divest, dispose of, or transfer ownership or control of all, any part, or any interest in, whether voluntarily or by operation of law, either inter vivos or upon death ("Transfer") the Member's Percentage Interest to any person (a "Transferee") other than the company or another Member, except in accordance with the terms of this Operating Agreement. Any Transfer, attempted Transfer, or purported Transfer in violation of the terms and conditions of this Operating Agreement shall be null and void.

Section 6.2. Permitted Transfers

(a) Notice of Transfer. Except in the case of an Involuntary Transfer pursuant to Section 6.3 below, any Member who proposes to Transfer his or her Percentage Interest (a "Transferor") shall send written notice to the Company and the other Members prior to any proposed Transfer stating the portion of the Percentage Interest proposed to be Transferred; the name and address of the prospective Transferee; the date on which the Transfer is to occur (which date shall not be less than 30 days after the date of the Notice of Transfer); and the sale price, the terms of payment, and the other material terms and conditions of the proposed Transfer (a "Notice of Transfer"). The Secretary of the Board of Directors shall deliver a copy of each Notice of Transfer to each other Member promptly upon receipt of the Notice, which when delivered shall constitute valid notice under Section 5.1(c)(iv) above of the proposed Transfer and the Member's rights with respect to the proposed Transfer. The Notice of Transfer shall constitute a request by the Transferor

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for an Affirmative Vote to the proposed Transfer. The Proposed Transferee may be the class of which the proposed Transferor is a member.

(b) Affirmative Vote. Each Member receiving the Notice of Transfer must, within 30 days of delivery of the Notice to the company, refuse to consent to the proposed Transfer, or the Member will be conclusively deemed to have consented to the proposed Transfer. The Company must, within 35 days of delivery of the Notice of Transfer to the Company, inform the Transferor that the Members refused to provide an Affirmative Vote to the proposed Transfer, or the Members will be conclusively presumed to have given an Affirmative Vote to the proposed Transfer. For purposes of this Section 6.2, the definition of Affirmative Vote in Section 5.1 above shall be revised to require the consent of all Members other than the Transferor.

(c) Transfer to Third Party. If the Transferor receives or is deemed to receive an Affirmative Vote to the proposed Transfer, the Transferor may Transfer the Percentage Interest pursuant to this Section 6.2(c), at which time the Transfer will be effective and the Transferee will be considered a Member.

(i) The Transferor may Transfer all (but not less than all) of the Percentage Interest identified in the Notice of Transfer to the third party designated in the Notice of Transfer at the same price and on the same terms of payment specified in the Notice of Transfer, provided that the Transfer is made within 120 days after the date of the Notice of Transfer.

The Transferee must sign a counterpart to this Operating Agreement, agreeing to be bound by this Operating Agreement to the same extent as if the Transferee had been an original party to the Operating Agreement as a Member.

(ii) The Transferee must, as part of the closing of the Transfer, sign a counterpart to this Operating Agreement, agreeing for the benefit of the other Members to be bound by this Operating Agreement to the same extent as if the Transferee had been an original party to the Operating Agreement as a Member.

(iii) The Transferee must, as part the closing of the Transfer, take all actions and execute all instruments required by the Company in order for the Transfer to comply with any applicable federal or state laws and regulations relating to the Transfer of Percentage Interests or with this Operating Agreement.

(iv) The spouse, if any, of the Transferee must, as part the closing of the Transfer, execute a spousal consent and acknowledgment in form satisfactory to the Company.

(d) Failure of Sale. If the Percentage Interest described in the Notice of Transfer is not Transferred within the applicable periods and in accordance with the foregoing provisions of this Section 6.2, the Percentage Interest shall again be subject to the restrictions of this Article 6.

Section 6.3. Involuntary Transfer

An Involuntary Transfer to a person other than the Company or another Member will be effective only after the applicable provisions of this Section 6.3 have been complied with. The creditor, receiver, trust or trustee, estate, beneficiary, or other person to whom a Percentage Interest is Transferred by Involuntary Transfer (the "Involuntary Transferee") will have only the rights provided in this Section 6.3. Involuntary Transfer means any Transfer of a Percentage Interest by operation of law or in any transaction, proceeding, or action, including a Transfer resulting from the dissociation of a Member, by or in which a Member would, but for the provisions of this Section 6.3, be involuntarily deprived or divested of any right, title, or interest in or to the Member's Percentage Interest, including, without limitation, (1) a Transfer on death or bankruptcy, (2) any foreclosure of a security interest in the Percentage Interest, (3) any seizure under levy of attachment or execution, or (4) any Transfer to a state or to a public office or agency pursuant to any statute pertaining to escheat or abandoned property or forfeiture.

(a) Notice to Company. The Transferor and the Involuntary Transferee shall each immediately deliver a written notice to the Company describing the event giving rise to the Involuntary Transfer; the date on which the event occurred; the reason or reasons for the Involuntary Transfer; the name, address, and capacity of the Involuntary Transferee; and the Percentage Interest involved (a "Notice of Involuntary Transfer"). The Notice of Involuntary Transfer shall constitute an offer (the "Offer") to sell the Percentage Interest identified in the Notice for an amount equal to the book value of the Percentage Interest, calculated as of the last day of the calendar month immediately preceding the date of the Involuntary Transfer, which shall be payable pursuant to the terms of payment set forth in the applicable provisions of Section 6.8 below. Book value shall be the net equity of the company, as reflected in the accounting, and not the tax, records of the Company, allocated proportionately among the Percentage Interests at the effective time of determination.

The Notice of Involuntary Transfer shall constitute an offer to sell the Percentage Interest equal to book value, calculated as of the last day of the calendar month immediately preceding the date of the Involuntary Transfer.

(b) Option to Purchase. Within the 90-day period commencing on the date of the receipt of the Notice of Involuntary Transfer, the Company shall either reject or accept the Offer by written notice to the Involuntary Transferee during the 90-day period.

(c) Failure to Exercise. If the Company does not accept the Offer or fails through no fault of the Transferor or Involuntary Transferee to close the Transfer within the applicable time period pursuant to Section 6.3(b) above, the Involuntary Transfer shall become effective. The Percentage Interest Transferred to an Involuntary Transferee pursuant to this Section 6.3(c) shall be considered in all respects a Percentage Interest held by the Member from whom it was Transferred for purposes of this Operating Agreement other than Articles 3 and 4 above, the nonmanagement provisions of which will apply to the Involuntary Transferee as though he or she held the Percentage Interest. Except as otherwise provided in this Operating Agreement, any actions that a Member takes or would be entitled to take with respect to a Percentage Interest, including without limitation votes, consents, offers, sales, purchases, options, or other deeds taken pursuant to this Operating Agreement, shall be taken by the Member for the Involuntary Transferee with respect to the Percentage Interest held by the Involuntary Transferee. This Section 6.3(c) shall constitute an irrevocable and absolute proxy and power of attorney (the proxy and power being coupled with an interest) granted by each Involuntary Transferee to the Member to (1) take such actions on behalf of the Involuntary Transferee without any further deed than the taking of the action by the Member, and (2) sign any document or instrument evidencing such action for or on behalf of the Involuntary Transferee relating to the Percentage Interest held by the Involuntary Transferee.

Each Member has the power to voluntarily withdraw from the Company by giving notice to the company at least 15 and no more than 60 days before the effective date of the withdrawal.

Section 6.4. Voluntary Withdrawal

(a) With Notice. Each Member has the power to voluntarily withdraw from the Company by giving notice to the company at least 15 and no more than 60 days before the effective date of the withdrawal. On the effective date of the withdrawal, the Company shall redeem all of the Percentage Interest held by the Member and any Involuntary Transferee to whom the Member has Transferred a Percentage Interest. The redemption price for the Percentage Interest shall be an amount equal to the book value of the Percentage Interest, calculated as of the last day of the calendar month immediately preceding the date of the redemption, which shall be payable pursuant to the terms of payment set forth in the applicable provisions of Section 6.8 below.

(b) Without Notice. Should any member withdraw from school without notice, and should a period of 60 days lapse without notice of intent to transfer membership interests, that membership interest shall be transferred to his or her class.

Should any member withdraw from school without notice, and should a period of 60 days lapse without notice of intent to transfer membership interests, that membership interest shall be transferred to his or her class.

(c) Withdrawal of Senior Class and Its Members. The President and secretary of the graduating (Senior) class may at anytime after April 30th of each year, give notice of voluntary withdrawal from the company on behalf of the member share interests held by the senior class and by the members of the senior class. The withdrawals shall then be treated as a voluntary withdrawal from the company of the senior class and the senior class members under Section 6.4(a) above.

Section 6.5. Marital or Community Property and Divorce

(a) Marital or Community Property Rights. For purposes of this Operating Agreement, any reference to a Percentage Interest shall include all interests in the Percentage Interest now or hereafter acquired by the spouse of a Member or Transferee as a result of (1) community or marital property during marriage, (2) a property division or other award or Transfer upon dissolution of marriage, (3) community or marital property, deferred marital property, or an augmented marital property estate, or (4) any allowance or assignment of property under provisions of any applicable community or marital property law. The creation of an interest in a Percentage Interest by operation of any applicable community or marital property law shall not be deemed to be a Transfer so long as the Percentage Interest in which an interest is created continues to satisfy the following two conditions:

(i) the Percentage Interest is registered in the name of the Member or Transferee; and

(ii) the Percentage Interest is controlled by the Member or Transferee.

(b) Option to Purchase. If the conditions set forth in either of Section 6.5(a)(I) or 6.5(a)(ii) above cease to be satisfied for any reason (including, without limitation, the death of the spouse of the Member or Transferee or the dissolution of marriage), the resulting Transfer shall be considered an Involuntary Transfer subject to the provisions of Section 7.3 above.

A spouse grants to the Member an irrevocable and absolute proxy and power of attorney to take actions on the spouse's behalf and sign any document or instrument evidencing the action for or on behalf of the spouse relating to the Percentage Interest.

(c) Member to Vote. Each Member shall vote with respect to all matters that come before the Members until the Transfer, if any, of the Percentage Interest to the Member's spouse pursuant to Section 6.5(b) above. By signing a spousal consent and acknowledgment, if a spouse is married to a Member at the time he or she becomes a Member, or by becoming the spouse of a Member, the spouse, without further act or deed, grants to the Member an irrevocable and absolute proxy and power of attorney (the proxy and power being coupled with an interest) to (1) take such actions on the spouse's behalf without any further deed than the taking of the action by the Member with respect to the Percentage Interest otherwise held by the Member, and (2) sign any document or instrument evidencing the action for or on behalf of the spouse relating to the Percentage Interest.

Section 6.6. Effect of Transfers

(a) Transfers. Until a Transfer is effective and the Transferee is considered a Member, if ever, pursuant to the applicable provisions of this Article 6, the Transferor shall be treated as the holder of the subject Percentage Interest, except to the extent provided in this Article 6. When a Transfer is effective and the Transferee becomes a Member, if ever, pursuant to the applicable provisions of this Article 6, the Company's records shall be amended to reflect the Transferee as a Member.

(b) Dissociation. Upon the dissociation of a Member, the Percentage Interest that is or has been Transferred to Involuntary Transferees by that Member, including Transfers resulting from the dissociation, shall not be taken into consideration under this Agreement, except with respect to the nonmanagement provisions of Articles 3 and 4 above, unless and until the Transferee of the Percentage Interest has been admitted as a Member pursuant to this Article 6.

(c) Voting After Dissociation. If, as a result of Section 6.6(b) above, there are either no Members or no Percentage Interests with respect to which a Member is entitled to vote, then all Involuntary Transferees otherwise holding Percentage Interests shall be entitled to vote with respect to the Percentage Interests notwithstanding any other provision of this Article 6, each Transferee shall be considered a member of the Company solely for purposes of determining compliance with section 183.0201 of the WLLCL. Nothing in the preceding sentence shall be construed to give a Transferee any rights that are not otherwise provided in this Operating Agreement.

Transfer payments shall be in cash within 30 days of closing, if not otherwise agreed.

Section 6.7. Time and Place of Closing

Except as otherwise agreed by the Company, the closing of any Transfer pursuant to this Article 6 shall occur at the Company's principal office on such day as the Transferee shall select pursuant to the provisions of this Article 6. The Transferee shall notify the Transferor and the company in writing of the exact date and time of closing at least 10 days before the closing date.

Section 6.8. Transfer and Payment of Purchase Price

At the closing, the Transferor shall deliver the Percentage Interest that is subject to the Transfer free and clear of any liens, security interests, encumbrances, charges, or other restrictions (other than those created pursuant to this Operating Agreement), together with all such instruments or documents of conveyance as shall be reasonably required in connection with the Transfer. If not otherwise agreed, payment shall be in cash within 30 days of closing.

Section 6.9. Subordination

Any obligation of the Company evidenced by a promissory note delivered pursuant to Section 7.8 above may be subordinated to the Company's obligations to any lender. Each holder of a promissory note shall enter into, and, upon request, from time to time confirm in writing the existence of, an agreement that sets forth the extent and manner of the subordination in such form as any lender of the Company reasonably requests; provided, however, that if there is no default in the company's performance of its payment or other obligations to the lender, the promissory note holder shall be entitled to receive regularly scheduled payments of principal and interest pursuant to the promissory note.

Section 6.10. Specific Performance

The parties declare that it may be impossible to measure in money the damages that will accrue to any party by reason of a failure to perform any of the obligations under this Article 6, and the parties agree that this Article 6 shall be specifically enforced. Therefore, if any Member or Transferee institutes any action or proceeding to enforce the provisions of this Article 6, any person, including the Company, against whom the action or proceeding is brought waives the claim or defense that the party has or may have an adequate remedy at law. The person shall not urge in any such action or proceeding the claim or defense that a remedy at law exists, and the person shall consent to the remedy of specific performance of this Operating Agreement. Notwithstanding the foregoing, no party may specifically enforce the obligation not to voluntarily withdraw in breach of this Agreement.

Article 7: Absolute Restrictions on Transfers

Legal fees shall be the Transferor's responsibility.

No Transfer of any Percentage Interest may be made if, in the opinion of the Company's legal counsel, the transfer or assignment (1) will result in the Company's being treated as an association for federal income tax purposes or (2) will violate any applicable federal or state securities laws. Before making any Transfer of any Percentage Interest, the Transferor must notify the Company in writing and the Secretary of the Managing Board of Directors shall, if he or she believes there is a material risk of violating this Article 7, obtain an opinion from the Company's legal counsel confirming whether the proposed Transfer will cause such a change in tax status or violation of securities laws. Legal fees shall be the Transferor's responsibility.

Article 8: Dissociation and Dissolution, Termination, and Liquidation of Company

Section 8.1. Dissociation

(a) Events of Dissociation. A Member shall cease to be a Member ("Dissociate") upon the occurrence of any of the following events:

(i) the Member makes a general assignment of the Member's assets, including his or her Percentage Interest, for the benefit of creditors;

(ii) the Member files a voluntary petition in bankruptcy;

(iii) the Member becomes the subject of an order for relief under the federal bankruptcy laws;

(iv) the Member files a petition or answer seeking for the Member any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any statute, law, or regulation;

(v) the Member files an answer or other pleading admitting or failing to contest the material allegations of a petition filed against the Member in any proceeding described in Clause (iv) above;

(vi) the Member seeks, consents to, or acquiesces in the appointment of a trustee, receiver, or liquidator of the Member or of all or any substantial part of the Member's properties, including the Member's Percentage Interest;

(vii) the expiration of 120 days after the commencement of any involuntary proceeding against the Member seeking reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any statute, law, or regulation, if the proceeding has not been dismissed;

(viii) the expiration of 120 days after the appointment without the Member's consent or acquiescence of a trustee, receiver, or liquidator of the Member or of all or any substantial part of the Member's properties, including the Member's Percentage Interest, if the appointment is not vacated or stayed, or at the expiration of 120 days after the expiration of any stay, if the appointment is not vacated;

(ix) if the Member is an individual, the Member's death or the entry of an order by a court of competent jurisdiction adjudicating the Member incompetent to manage the Member's person or estate;

(x) if the Member is a trust or is acting as a Member by virtue of being a trustee of a trust, the termination of the trust, but not merely the substitution of a new trustee;

(xi) if the Member is a corporation, partnership, or separate limited liability company, the dissolution and commencement of winding up of the Member;

(xii) the Transfer, pursuant to Article 6 above, by the Member of all of the Member's Percentage Interest; or

(xiii) the Member ceases to contract with the company to provide professional services to its customers.

(b) Effect of Dissociation. The Dissociation of a Member shall not result in the Transfer of the Member's Percentage Interest except as provided in Article 6 above.

(c) Inactive Member Definition. A member shall become an inactive member upon loss of his or her entire membership share interests. An inactive member may earn shares and return to active status. An inactive member may participate in the company but will not share in current or liquidating distributions of the company.

An inactive member may earn shares and return to active status. An inactive member may participate in the company but will not share in current or liquidating distributions of the company.

Section 8.2. Events Causing Dissolution

The Company shall be dissolved upon the happening of any of the following: (1) the sale or other disposition of all or substantially all the Company's assets; (2) the election by a unanimous Affirmative Vote to dissolve the Company; or (3) the Dissociation of any Member, unless, within 90 days of the date on which the Company receives written notice of the Dissociation, the Members vote to continue the Company by Affirmative Vote.

Section 8.3. Termination

Dissolution of the Company shall be effective on the date on which the Dissolution Event occurs, but the Company shall not terminate until articles of dissolution have been duly filed under the WLLCL, the Company's affairs have been wound up, and the Company's assets have been distributed as provided in Section 8.4 below. Notwithstanding the dissolution of the Company, this Operating Agreement shall continue to govern the company's business and the Members' affairs until the Company is terminated and liquidated.

Section 8.4. Liquidation

Upon expiration of the 90-day period described in Section 8.2 above, the Members shall appoint by Affirmative Vote a liquidator of the Company, who may but need not be a Member of the Managing Board of Directors, an Officer, or a Member. The liquidator shall have the same authority granted to the Managing Board of Directors in Section 5.1 above, and he or she shall proceed with the winding up and liquidation of the Company by applying and distributing its assets as follows:

(a) Payment of Debts to Third Parties. The assets shall first be applied to the payment of the Company's liabilities (other than any loans or advances that may have been made to the Company by a Member) and the liquidation expenses. A reasonable time shall be allowed for the orderly liquidation of the Company's assets and the discharge of liabilities to creditors so as to enable the liquidator to minimize any losses resulting from the liquidation.

(b) Payment of Debts to Members. The remaining assets shall next be applied to the repayment of any loans or advances (but not any Capital Contribution) made by the Members to the company, in proportion to the relative amounts lent or advanced.

(c) Payment of Distributions to Members. The remaining assets shall be distributed to the Members pursuant to Section 3.2(a) above.

(d) Reserve. Notwithstanding the provisions of Sections 8.4(a), 8.4(b), and 8.4(c) above, the liquidator may retain such amount as the liquidator reasonably deems necessary as a Reserve for any contingent liabilities or obligations of the Company, which funds shall, after the passage of a reasonable period of time, be Distributed in accordance with the provisions of this Article 8.

The assets shall first be applied to the payment of the Company's liabilities (other than any loans or advances that may have been made to the Company by a Member) and the liquidation expenses.

Section 8.5. Filing and Notice

The liquidator shall promptly, upon his or her appointment, execute and file on the company's behalf articles of dissolution as provided in section 183.0906 of the WLLCL. The liquidator shall also notify the company's known claimants as provided in section 183.0907 of the WLLCL and publish a notice of the Company's dissolution as provided in section 183.0908 of the WLLCL, except as otherwise determined by the liquidator with an Affirmative Vote.

Section 8.6. Distributions in Kind

If any Company assets are to be distributed in kind, the assets shall be distributed on the basis of their Value, and any Member entitled to an interest in the assets shall receive the interest as a tenant-in-common with all other Members so entitled.

Section 8.7. Limitation on Liability

Each holder of a Percentage Interest shall look solely to the Company's assets for all distributions from the Company and the return of his or her Capital Contribution to the Company and shall have no recourse (upon dissolution or otherwise) against any other Members or any of their affiliates.

Article 9: Books and Records

Section 9.1. Books and Records

The Company's books and records shall be maintained at the Company's principal office or at any other place designated by the Secretary of the Managing Board of Directors and shall be available for examination by any Member or his or her duly authorized representative(s) at any reasonable time.

Section 9.2. Company Funds

The Company's funds may be deposited in such banking institutions as the Secretary of the Managing Board of Directors determines, and withdrawals shall be made only in the regular course of the Company's business on such signature or signatures as the Members determine by Affirmative Vote. All deposits and other funds not needed in the operation of the business may be invested in certificates of deposit, short-term money market instruments, government securities, money market funds, or similar investments as the Secretary of the Managing Board of Directors determines.

Section 9.3. Availability of Information

The Company shall keep at its principal office and place of business, and each Member shall have the right to inspect and copy, all of the following: (1) a current list of the full name and last-known business address of each Member or former Member set forth in alphabetical order, the date on which each Member or former Member became a Member and the period of his or her Membership, and the date on which any former Member ceased to be a Member; (2) a copy of the Articles and all amendments to the Articles; (3) copies of the Company's federal, state, and local income tax returns and financial statements, if any, for its four most recent years; (4) copies of this Operating Agreement and any effective written amendments to this Operating Agreement; and (5) any records kept pursuant to this Operating Agreement, including without limitation those described in Article 5 above. Each Member shall have the right to obtain from the Company from time to time on reasonable demand, at the Member's cost and expense, copies of any such information.

All deposits and other funds not needed in the operation of the business may be invested in certificates of deposit, short-term money market instruments, government securities, and money market funds.

Article 10: Reports

Within 60 days after the end of each Fiscal Period, the Managing Board of Directors shall send or direct to be sent to each person who was a Member at any time during the Fiscal Period then ended (1) a balance sheet as of the end of the Period, (2) statements of income, Members' equity, changes in financial position, and a cash flow statement for the Fiscal Period then ended, and (3) such tax information as is necessary or appropriate for the preparation by the Members of their individual federal and Wisconsin income tax returns. In addition, the Managing Board of Directors shall provide reports on a more frequent basis to a requesting Member to the extent reasonably requested by the Member. Fiscal Period means any 12-month period ending on December 31 or any portion of such period for which the Company is required to allocate income, gain, loss, or deduction for federal income tax purposes.

Article 11: Miscellaneous

Section 11.1. Amendments to Operating Agreement

No amendment or modification of this Operating Agreement shall be valid unless in writing and signed by all of the Members. Though action taken by the Managing Board of Directors shall constitute an amendment to this Operating Agreement except to the minimum extent, if any are necessary to give effect to the action.

Section 11.2. Binding Provisions

The agreements contained in this Operating Agreement shall be binding on and inure to the benefit of the successors and the signs of the parties to this Operating Agreement.

Section 11.3. Applicable Law

This Operating Agreement shall be governed by and construed in accordance with the laws of the state of Wisconsin without regard to its choice of law provisions.

Section 11.4. Separability of Provisions

Each provision of this Operating Agreement shall be considered separable, and if for any reason any provision or provisions of this Operating Agreement are determined to be invalid and contrary to any existing or future law, the invalidity shall not affect or impair the operation of those portions of this Operating Agreement that are valid.

Section 11.5. Headings

Section headings are for descriptive purposes only and shall not control or alter the meaning of this Operating Agreement as set forth in the text.

No amendment or modification of this Operating Agreement shall be valid unless in writing and signed by all of the Members.

Section 11.6. Interpretation

When the context in which words are used in this Operating Agreement indicates that such is the intent, words in the singular shall include the plural, and vice versa, and pronouns in the masculine shall include the feminine and neuter, and vice versa.

Section 11.7. Dispute Resolution

(a) Confidentiality. This Operating Agreement, the Company's business and affairs, the Company's books and records, and any information relating to the foregoing are confidential and private. Each person holding a Percentage Interest agrees to maintain the confidentiality and privacy of, and not to disclose, any such information.

(b) Disputes. Any dispute arising with respect to this Operating Agreement, its making or validity, its interpretation, or its breach shall be settled by arbitration in Weyerhaeuser, Wisconsin, pursuant to the then-obtaining rules of the American Arbitration Association. Such arbitration shall be the sole and exclusive remedy for such disputes except as otherwise provided in this Operating Agreement. Any award rendered shall be final and conclusive upon the parties, and a judgment may be entered in any court having jurisdiction.

(c) Costs. If any proceedings are instituted by any person with respect to any dispute arising under or to collect any benefits due under this Operating Agreement, the prevailing party in the proceedings shall be entitled to recover the costs of the proceedings and reasonable attorney fees from the other party; provided, however, that the Company may offset any amounts owed by it to another person by reason of this Section 11.8(c) against any funds or other property that are in the Company's possession and that are owed by the Company to, or owned by, that other person.

Section 11.8. Notice

Any notice required or permitted to be given pursuant to this Operating Agreement shall be valid only if in writing and upon actual receipt by the intended recipient of the Notice. Any person required to give notice pursuant to this Operating Agreement shall have the burden of proving the validity of the notice.

Section 11.9. Counterparts

This Operating Agreement may be executed in counterparts, all of which shall constitute the same agreement.

IN WITNESS WHEREOF, the undersigned have executed this Operating Agreement on October 26, 1994.

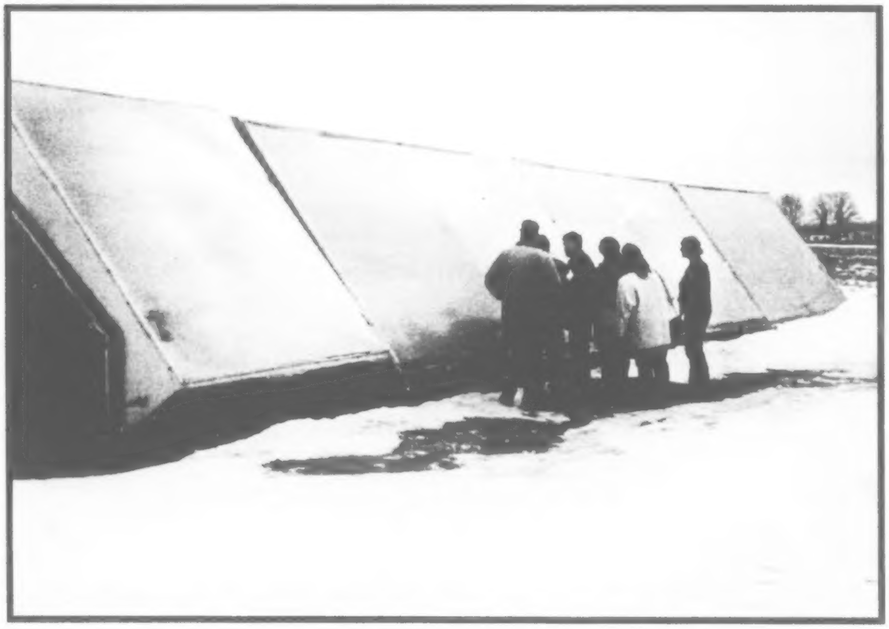
Acknowledgment

Heidi Rouleau, Organizer, acknowledged that Exhibit A contained a correct copy of the Articles of Organization filed with the Wisconsin Secretary of State to organize the Company.

Business Operations

Solar kilns are basically greenhouses that trap the sun's energy and circulate the heated air through stickered stacks of lumber. After the solar powered kilns were constructed, procedures were developed to actually market the service, and load, dry and complete the lumber drying process. Presently, the BHMP is drying lumber for any individual or company in the area. The 1994–95 cost was twenty-five cents per board-foot, for any amount of lumber. The BHMP slanted kilns were constructed by the students to face

This Operating Agreement will be a valuable resource to other schools planning an entrepreneurship program.



▲ *Area employers inspect the BHMP solar-powered kilns.* ▲

within five degrees of due south for maximum solar exposure. In choosing a location for the kilns, students also had to keep in mind that the winter sun in northern Wisconsin is quite low, so they needed to avoid nearby southerly obstructions.

Loading the Kilns

Procedures were developed to sort and load the lumber to be dried.

Procedures were developed to sort and load the lumber for drying. Ideally, the lumber should be sorted by thickness and species, however, the students learned that this is not always possible. The students learned in both ecology and technology education classes that lighter density woods like basswood, butternut, and aspen could be dried together. Medium density woods such as cherry, walnut, and ash and dense woods like red oak and white oak could be dried together.

The Production Team Leader developed the form *Figure 2.5 Kiln Loading Data Sheet* to track the lumber loaded. The students loaded the kilns with the quicker drying species on the top so they could be unloaded when dry, and the slowest drying thickness was placed on the bottom so they could be left to continue drying. Wood spacers or "stickers" were placed between the layers of wood.

A vital aspect of the BHMP business is knowing when the lumber is dry.

▲ *Richard Manor, Project Coordinator (right) explains the lumber drying process to area businessmen interested in having their lumber dried by the Blue Hills Manufacturing Partnership.* ▲

Tracking the Temperature and Humidity

A vital aspect of the BHMP business is knowing when the lumber is dry. Proper drying requires careful pacing and close control of both temperature and humidity throughout the process. Bill Simpson, the chemistry and physics instructor, along with Tony Ziesler, mathematics teacher, instructed the

(Text continued on page 81)

Figure 2.5

Kiln Loading Data Sheet

Blue Hills Manufacturing Partnership
Weyerhaeuser High School

Today's date: ______________________________

Person entering data: ______________________________

Lumber loaded in kiln number: ________ **Where: Top** _____ **Bottom** _____ **All** _____

Species: ______________________________

Amount of lumber (board feet): ______________________________

All one length: __________ **Various lengths:** __________

Date kiln was loaded: ______________________________

Customer name: ______________________________

Address: ______________________________

City: ______________________________

Phone number: ______________________________

Desired % of moisture at end of drying: ________________

Checked for moisture content: **Date:** ________________

% at check: ____________

Time in kiln: ____________

Load was finished drying on (date): ________________

% moisture at end and total time in kiln: ________________

Figure 2.6

Temperature/Relative Humidity Data

Blue Hills Manufacturing Partnership
Weyerhaeuser High School

Today's date: ____________________

Person(s) processing data: ____________________

Dates of readings: **START date:** __________ **END date:** __________

Kiln number: ____________________

Species: ____________________

Dimensions: ____________________

Initial % of moisture in wood: ____________________

Date kiln loaded: ____________________

	OUTSIDE	**KILN**	**RELATIVE HUMIDITY**
No. of data points:	________	________	________
High:	________	________	________
Low:	________	________	________
Average:	________	________	________
File name (saved as):	________	________	________

students in monitoring the temperature and humidity within the kilns and the lumber using the form *Figure 2.6 Temperature/Relative Humidity Data.* Data loggers were purchased through Forestry Suppliers, Inc., P.O. Box 8397, Jackson, Mississippi 39284-8397, (800) 647-5368. The data loggers are units used to preprogram the temperature in the kilns, for up to one year. The students read the data input every 30 days to determine the ratio of the temperature outside of the kiln to the temperature inside. This data was then entered into a computer, graphed and analyzed. Monthly printouts of this graphed data were kept and analyzed to help predict the time needed to dry lumber under various conditions in the future.

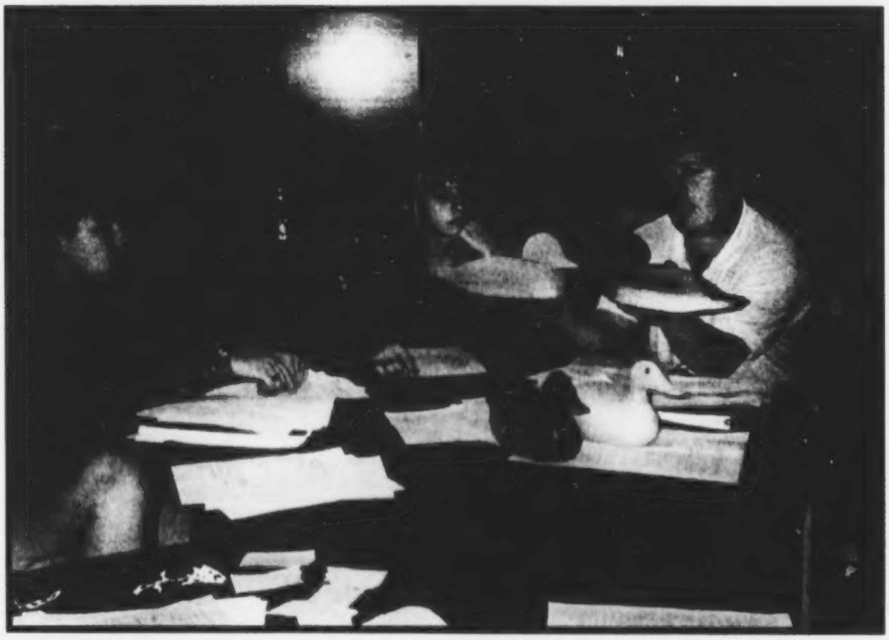
Besides drying lumber for individuals and area businessmen, the BHMP is able to dry lumber for the benefit of all students in the school.

Product Development

Besides drying lumber for individuals and area businessmen, the BHMP is able to dry lumber for the benefit of all students in the school. For example, the sophomore class at Weyerhaeuser has developed and marketed a very successful wood box project. These students construct lovely wooden boxes, lined with felt. Prior to selling these boxes, they have the lids laser burned with designs and logos. The boxes are then sold to various customers, including some Wisconsin Indian tribes, who include two decks of cards and sell them at their gaming casinos. The sophomore class has earned a lot of money and valuable experience with this project. Now, the lumber they use can be dried by the BHMP.

Students in the BHMP have explored new products for future development. This year's key product was a replica of a duck decoy made by a Weyerhaeuser company 40–50 years ago. A replicating machine was pur-

Students in the BHMP have explored new products to be developed by the company.



▲ *Jenny Jacobs, MTL (left), Chris Koehler, VP, and Richard Manor, Project Coordinator discuss the decoy replication product.* ▲

chased, and the Partnership can replicate the decoys using kiln dried wood and sell them for around $50–$75. An antique decoy sells for about $125 in the northern part of Wisconsin. The ducks were labeled as replications by the Blue Hills Manufacturing Partnership. Students even researched the original decoy company as an English assignment. Other integration experiences for the decoy project included developing brochures, graphics, packaging, advertisements and general marketing and production plans. At least ten gift shops around the area were contacted to sell the decoys.

Other integration experiences for the decoy project included developing brochures, graphics, packaging, advertisements and general marketing and production plans.

WEYERHAEUSER
XXL
ATH. DEPT

▲ *Ivan Martin (left) and Woody Johns, PTL, display decoys at the replicating machine.* ▲

The main integration goal in the third quarter was school-wide involvement in the BHMP logo contest.

The BHMP Logo

The students and teachers of Weyerhaeuser decided that the Blue Hills Manufacturing Partnership needed a logo. The teachers met during an inservice to work on a goal of school-wide involvement in the development of a logo. The major points emphasized in the inservice included cooperation, communication, and entrepreneurship.

It was important for all students to be involved in this aspect of the project, therefore it was decided that the following grades and corresponding activities would be implemented.

K-2nd Grades

- Logo contest (identifying famous logos).
- Relate these activities to BHMP.

K-4th Grades

- A logo identifying contest held in the individual classrooms.
- Relate these activities to BHMP.
- Comic strip about BHMP.

3rd & 4th Grades

- Redesign an existing logo.
- Each class design a logo that represents that individual class.
- Relate these activities to BHMP.

5th-12th Grades

- Design a logo for BHMP to be judged by the BHMP board, officers, and team leaders.
- Suggested methods:
  - Worksheet on logos (crossword puzzles)
  - Design logos for cards, stationery, and ads
  - Paint winning logo on the BHMP storage shed
  - Design a school logo or new Wildcat logo
  - Design ads for logo
  - Create jingles
  - Work on a music video
  - Write articles about our logo design process
  - Business cards
  - Brochures
  - Labels
  - T-shirt logo sales for basketball games
  - Posters
  - Invent games relating to BHMP
  - Prizes (savings bonds, calculators, T-shirts)

In chemistry, the students analyzed the residue from the kilns for proof of environmentally friendly business for possible use on the logo.

Additional activities focusing on logos were implemented in various courses. In English classes, students researched the making and copyrighting of logos. In civics, students explored the use of logos in advertising across various media (newspapers, TV, radio). In math and geometry, students studied geometric shapes and ergonomics as they relate to advertising. In chemistry, the students analyzed the residue from the kilns for proof of environmentally friendly business for possible use on the logo. The use of alternative energy promotion for the logo was explored in the ecology/biology class.

The use of alternative energy promotion for the logo was explored in the ecology/biology class.

To develop a logo unique to the Blue Hills Manufacturing Project, a school-wide logo contest was held for students in grades 5-12. The entries had to be original designs and could not be copied or duplicated from other sources. A panel of judges, including BHMP's president, vice president, board of directors, and team leaders, reviewed all entries to select the new logo. To encourage student participation, the first, second, and third place winners received an award, including a savings bond. The first place winner received a $100 savings bond, while the second and third place winners received $50 and $25 savings bonds, respectively.

(Text continued on page 85)

Figure 2.7

1995 Logo Design Contest

Contest Rules
Blue Hills Manufacturing Partnership
A Limited Liability Company

Eligibility: Entrants must be enrolled at Frederick Weyerhaeuser school in grades 5-12.

Dates: Entries must be received by Monday, March 20, 1995.

Subject Matter: The design must be the artist's *original creation* and shall not be copied or duplicated from previously published art.

Technical Requirements:

Color: The design is limited to black and white.
The color must be flat and solid, with no shading or blending.

Shape and Size: The design must be no bigger than 6" by 6".

Lettering: The wording that must appear on the logo is *Blue Hills Manufacturing Partnership, A Limited Liability Company*
The artist may arrange the lettering in any way.
All wording must be used.
No other wording, *including the artist's signature,* may appear on the design.

Suitability for Reproduction:

Blue Hills Manufacturing Partnership, LLC, reserves the right to alter the design if necessary. This includes redrawing and resetting type.

Submission Procedures:

All entries, along with the completed entry form, should be given to Miss Shuda in the art room.
Each student may submit only *one* entry.

Judging of the Contest:

The panel of judges will consist of the President, Vice President, the Board of Directors, and the Team Leaders of BHMP.

Awards:

First place:	$100 U.S. Savings Bond
Second place:	$50 U.S. Savings Bond
Third place:	$25 U.S. Savings Bond

- -

Entry Form

Artist's name ____________________

Address ____________________ City and ZIP code ____________________

Telephone number ____________________

I verify that I have read and comply with all the contest rules, and that I meet the eligibility requirements.

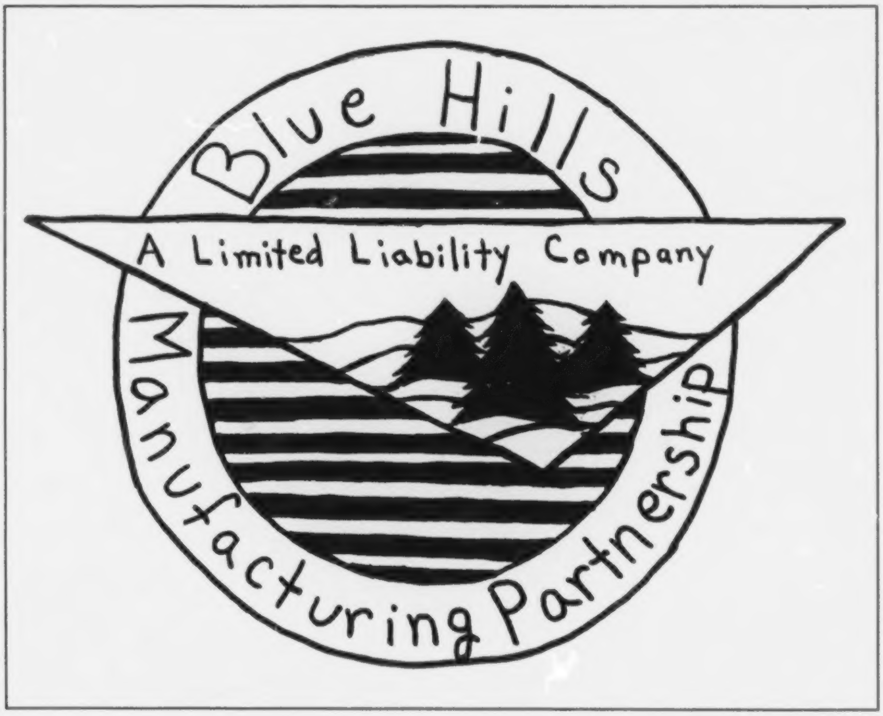
Artist's signature ____________________ Date ____________

Parent or guardian signature ____________________ Date ____________

The art department, and the art teacher Jaci Shuda, were instrumental in the planning and implementation of the logo design contest. Ms. Shuda organized the logo contest, advised students in designing business cards and stationary, and held field trips for students to see logos printed at a nearby screen printing company. A copy of the contest rules and entry form are featured in *Figure 2.7, 1995 Logo Design Contest.*

First place winner was Darcy Thull, a sophomore. Below is a copy of her winning logo idea.

The art teacher organized the logo contest, advised students in designing business cards, and held field trips for students to see logos printed at a nearby screen printing company.



Student Board Meetings

The student board and officers met twice a month to conduct Blue Hills Manufacturing Partnership business. During these meetings, Robert's Rules of Order were followed and agendas were used. An example of an actual meeting agenda is shown below.

The student board and officers met twice a month and Robert's Rules of Order were followed.

Agenda 2/22/95
Blue Hills Manufacturing Partnership, LLC

1. Work on entering all names of students involved in the BHMP project in the official membership roster. Need to get all Social Security numbers.
2. Work on revising the bylaws and clearing up some of the conflicting areas. Discuss the status of the decoy manufacturing activity.
4. Discuss the prospect of drying lumber for Weather-Shield Corporation.
5. Report from Woody Johns (Production Team Leader) on status of lumber being dried at this time.

6. Work on marketing strategies for the next loads of lumber.
7. Discuss the status of stock.
8. Review the temperature and humidity monitoring equipment graphs.
9. Reply to letter from Jenny Bonczyk on questions about kilns.
10. Discuss the upcoming logo contest and how to promote it (prizes, time frame, parameters).
11. Write an article for Scott Sklars on alternative energy (1222 C Street, Washington, D.C.).
12. Contact Dan Lepinski for article for *Home Power* magazine (Rt. 1, Box 268-A, Exeland, WI 54835; (715) 934-2525).
13. Follow-up to *Lumber & Logging* magazine article.
14. Contact TV 13 about the project.
15. Contact community about status of Weyerhaeuser building project.

Results

Overall, the students, teachers, administrators and community members of Weyerhaeuser were very pleased with the first year results of the Blue Hills Manufacturing Partnership. Additionally, the innovative, student-run business received a great deal of local and national recognition from the media, including magazines, newsletters, newspapers, television and radio.

Thirteen out of 16 juniors, and 13 out of 22 seniors, earned an additional quarter of a share by attaining honor roll status for three quarters.

Figure 2.8, Junior Class Shares and *Figure 2.9, Senior Class Shares* illustrate the class share earnings for the 1994–95 year. Thirteen out of 16 juniors, and 13 out of 22 seniors, earned an additional quarter of a share by attaining honor roll status for three quarters. Loss of stock did not occur in the junior class and only two students lost stock in the senior class. The number of discipline referrals decreased for both juniors and seniors compared to last year, with a reduction from four to zero in the junior class and a reduction from 27 to 12 in the senior class. The graph below illustrates this information.

(Text continued on page 89)

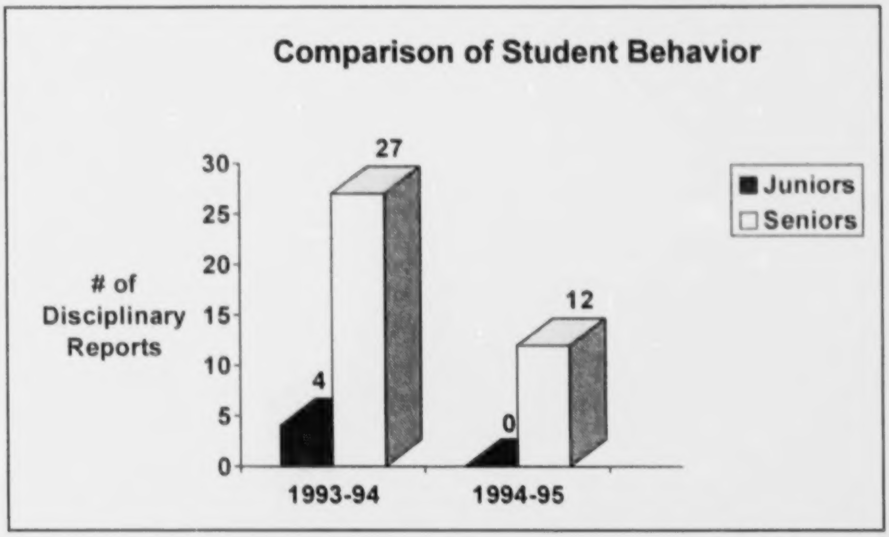


Figure 2.8

Junior Class Shares

#	Sex	Regular Shares	Board Members & Officers	Honor Roll for 3 Quarters	In School Suspension	Out of School Suspension	Total
1	F	1		0.25			1.25
2	M	1	2	0.25			3.25
3	F	1	2	0.25			3.25
4	M	1					1.00
5	F	1	2	0.25			3.25
6	M	1					1.00
7	F	1		0.25			1.25
8	F	1	3	0.25			4.25
9	M	1		0.25			1.25
10	F	1	2	0.25			3.25
11	M	1		0.25			1.25
12	M	1		0.25			1.25
13	F	1		0.25			1.25
14	M	1					1.00
15	M	1					1.00
15	F	1		0.25			1.25
16	M	1		0.25			1.25
Class Shares							16.00
Total Class Shares							**42.75**

Figure 2.9
Senior Class Shares

#	Sex	Regular Shares	Board Members & Officers	Honor Roll for 3 Quarters	In School Suspension	Out of School Suspension	Total
1	F	1		0.25			1.25
2	M	1			-0.25		0.75
3	M	1		0.25			1.25
4	F	1	2	0.25			3.25
5	M	1	2				3.00
6	M	1	2	0.25			3.25
7	M	1					1.00
8	M	1		0.25			1.25
9	F	1		0.25			1.25
10	M	1	2	0.25			3.25
11	M	1	2				3.00
12	M	1				-0.5	0.50
13	F	1		0.25			1.25
14	M	1					1.00
15	M	1					1.00
16	F	1	2	0.25			3.25
17	F	1		0.25			1.25
18	F	1		0.25			1.25
19	M	1					1.00
20	M	1	3	0.25			4.25
21	M	1					1.00
22	F	1		0.25			1.25
Class Shares							22.00
Total Class Shares							**61.25**

Profits were less than anticipated in the first year of the project, amounting to approximately four to five dollars per share. It is projected that the profits will increase dramatically with each additional year of business experience. In fact, many freshmen and sophomores are expecting to earn significant amounts of money to be used for graduation expenses and class trips through participation in the BHMP.

Participant Responses

Overall, students and teachers felt that the Blue Hills Manufacturing Partnership has made the learning process more interesting and relevant for all students. According to Woody Johns, Production Team Leader, he has learned to manage people and work as a team player, a skill he feels is very important. "When you work as a team," he said, "others can help you see and understand something you may have missed. I just wish this program would have been available to me when I first started high school...then I would have had four years to learn everything I am learning now."

"... I just wish this program would have been available to me when I first started high school...then I would have had four years to learn everything I am learning now."

Management Team Leader, Jennifer Lynn Jacobs, indicated that she "enjoyed being a part of an organization that you need to have some qualifications for; it makes me feel important." When asked about her plans after graduating, she said "I am planning on attending college and majoring in some type of business. I feel that being the Management Team Leader for this company has given me a head start!"

"I now have an idea of how to do resumes and interviews. I also have a better understanding of how a company works" stated Sarah Burak, a junior. "This experience taught me to be calm and cool in situations when we (the board of directors) did not all agree." This should prove useful to Sarah in the future since after high school she would like to pursue a career in law enforcement.

When asked about the advantages of being a part of BHMP, Heidi Rouleau, Secretary, indicated feeling that the interview process was helpful to her. She felt she has also learned a lot about note taking and identifying the important facts. "I learned a lot from the lawyer, about bylaws and legal things."

Chris Koehler, Vice-President and a junior, explained that this experience taught her "to admire entrepreneurs and other people who start their own business. They have a lot of courage to risk so much and try something new. Starting our business made me realize that you have to work extremely hard to just get a business set up. These people deserve our congratulations."

Summary

The Blue Hills Manufacturing Partnership was developed to provide students in the school district with an opportunity to acquire work experience and employability skills. It was anticipated that once students developed these foundational skills for the future, they would make smooth transitions from high school to postsecondary education, or competitive employment. Instead of developing an entirely new program, which would require a great deal of time and effort on the part of teachers, they decided to adapt the existing curricula to parallel the new business venture. A key focus of the project was taking abstract theory and relating it to a real business.

A key focus of the project was taking abstract theory and relating it to a real business.

In addition to the integration activities outlined in the curriculum section of this chapter, the following activities were also used to focus on integration:

- The music department developed radio and TV spots for marketing ads.
- The math department used graphing from the state-of-the-art temperature and humidity monitoring equipment in the kilns to illustrate "real life" situations.
- The social studies/civics department studied the history of Weyerhaeuser as it relates to the logging industry and now has an actual business to use in the Junior Achievement part of its courses.
- The science department worked with the Wisconsin Department of Natural Resources on forest management studies of the school's forests for future use and explored other alternative energy sources.
- The family and consumer education teacher looked at drying other products such as flowers, foods, vegetables, ginseng, and mushrooms.
- In chemistry, students analyzed residue from the kilns to determine its content, and studied environmentally friendly businesses.
- The technology education department started a BHMP newsletter and worked on a video production of the entire operation.
- The physical education department developed first aid and safety procedures for the business.
- The English department researched school logos, studied copyrights, and sent letters to politicians describing the use of the grant by the district.

"...We took an idea and transformed it into a working operation that will be passed down to future classes indefinitely. We are hoping that our example will be a catalyst for other schools to try similar programs in integration and entrepreneurship."

According to Richard Manor, Project Coordinator, "We took an idea and transformed it into a working operation that will be passed down to future classes indefinitely. We are hoping that our example will be a catalyst for other schools to try similar programs in integration and entrepreneurship."

In an effort to incorporate career development, plans are also underway to have groups of students interview business owners in the surrounding towns and cities to determine hiring practices, wages, educational requirements, and to obtain copies of job descriptions. This information will be collected and used to help direct the Weyerhaeuser Area School District's three-year school-to-work plan.

Suggestions for Replication

The first year efforts of the Blue Hills Manufacturing Partnership were very successful. The positive outcome of the project was a result of many factors; however, the strong administrative and community support pledged to the project from the beginning was crucial. Additionally, the Weyerhaeuser VALP team demonstrated a strong commitment to the project and tried to effectively "bring on board" all of the school's teachers and students. Sometimes, their efforts were not always well received, but motivated members of the VALP team forged ahead and even wrote other teachers' curricula for them, in order to keep the project's momentum flowing. Over time, it seemed that most of the reluctant teachers softened their attitudes and realized the benefits of applying their coursework to the BHMP.

Time was a critical factor for teachers. In lieu of time restraints during the school year, the VALP team strongly recommended completing the majority of the project and curricula development during the summer, prior to implementing the project. Additionally, they suggested that administrators budget and arrange for the teachers to meet on a regular basis throughout the school year. Since this did not happen at Weyerhaeuser, many of the day to day operations fell on the shoulders of the project coordinator/technology education instructor, with limited help from a few other teachers.

During the first year, all juniors and seniors were included in the project in some way. When interviewed regarding things they might change, some students said they would prefer to choose whether or not they wanted to participate. Some students indicated they did not wish to be involved, which posed a question regarding how to gain student interest.

Many teachers pondered the question of how to motivate students. Since profits were projected to be somewhat low in the start-up year, money was not as motivating as first anticipated. Also, some students had rigorous course schedules prior to the implementation of this project, and felt that there just wasn't strong enough incentive for them to participate at a high level. Students, as well as teachers, indicated a desire for students to obtain some type of course credit for participation above and beyond regular integrated classroom work. One consideration is an applied and integrated "fieldwork" credit.

It is strongly recommended that the area of program evaluation be given serious time and consideration when developing this type of project.

Finally, it is strongly recommended that the area of program evaluation be given serious time and consideration when developing this type of project. Since Weyerhaeuser is unique in size and demographic makeup, they were unable to secure a control or comparison group for the first year of operation. Evaluation procedures took a back burner to program development and implementation. According to the staff at Weyerhaeuser, this is an area they will continue to develop as the program evolves. However, other schools are encouraged to set up their evaluation procedures immediately and modify as needed throughout the process.

The Blue Hills Manufacturing Partnership will continue to be an integral part of the Weyerhaeuser School District's school-to-work program plan. The BHMP will provide students with opportunities to develop work experience and to apply academic and vocational learning experiences in a realistic business venture.

3

Food For Thought

Conducted by Sauk Prairie High School
Compiled by Catherine L. Weis, Center on Education and Work

Key Features

The "Food For Thought" (FFT) program was developed to provide an alternative learning environment for special population students who historically struggled with the traditional educational setting. Nine students were selected to participate in the alternative program which integrated math, science, English, social studies, physical education, and food service to focus on the operation of a student-operated, school based breakfast program. Students developed employability, conflict resolution, and academic skills through applied activities. Participation in the Food For Thought program allowed students to see the "real world" application of their learning experiences.

Participation in the "Food For Thought" program allowed the students to see the "real world" application of their learning experiences.

Demographic Information

Sauk Prairie High School is located in the village of Prairie du Sac, Wisconsin, and serves the surrounding communities, including Sauk City. Unlike larger communities, employment opportunities in the area are limited and many residents endure commutes to larger cities in order to maintain employment. Sauk Prairie High School serves approximately 762 students with approximately 23% of those students being identified as having exceptional educational needs. Ten percent of the student population is considered at-risk, with a high incidence of habitual truancy.

Participant Information

The Food For Thought program was designed to focus on students at the highest risk for not completing high school. In an attempt to counteract poor attendance records, discipline problems, and below average academic achievement levels the program was developed to give practical meaning to the high school experience. Based upon their interactions with students, teachers and counselors recommended individuals who seemed to be good candidates for an alternative learning program.

The Food For Thought program was developed to counteract poor attendance, discipline problems, and below average academic achievement.

From the teacher and counselor referrals, a pool of approximately 25 students was created. Each student being referred was provided with an application form and a short description of the Food For Thought program. Students were not required to apply, and were asked to complete the application only if they were interested in participating. The application form used is shown in *Figure 3.1*. Once all of the applications were received, students were invited to interview for the limited number of program openings. Interviews were conducted by the high school principal, the project coordinator, and the project teacher. Interview questions focused on the identification

Figure 3.1

Food For Thought Student Application

Have you heard of the new alternative program called Food For Thought? It might be right for you! You have been recommended to us by one of your teachers. If you are interested in lots of hands-on activities; 6-7 credits for completing the program; cooking/small business; an alternative learning program; and a small class size (9 students), please fill out the application below. Give it to a teacher or return it to us in Room 45 by Wednesday, October 12. We look forward to talking to you about our new alternative program.

Personal Data

Name ____________________ Date __________

Address ____________________ Phone __________

Date of Birth ____________________ Social Security # __________

Counselor ____________________ Phone __________

Name of Parent(s) ____________________ Phone __________

Educational Data (List all vocational elective courses taken during high school.)

Grade	Course

Employment Data (List all jobs held to date.)

Employer	Job Title	Length of Employment

Career Goal (Which best describes your plans after high school?)

☐ Enter labor market

☐ Attend a voc-tech school

☐ Attend a 4-year college/university

☐ Other

What is your career goal 5 years from now? ____________________

Why are you interested in the Food For Thought program? ____________________

References (List 3 teachers from Sauk Prairie High School.)

____

____

____

Responsibility Statement for Students

I understand that this is an application for enrollment into the Food For Thought program, and if I am accepted, I will accept the responsibility required by both the school and the employers. I further understand that any false or misleading information made on this application will terminate further consideration of my application. I understand that completing this application does not guarantee that I will be accepted into Food For Thought.

Student Signature ____________________ Date __________

Signature of parent/guardian ____________________ Date __________ of each student's level of interest and motivation. Each applicant was presented with the following questions:

1. Why do you believe you are right for this program?
2. Why do you believe you can succeed in this program?
3. How do you think this program might be different from regular classes?
4. What do you think about truancy and how does it affect your education?
5. How do you feel about coming to school early?
6. How do you think this program will help you become more prepared for working outside of school?

As the final part of the interview, students were presented with a scenario outlining a job related conflict and were then asked, "How would you solve this conflict?" In addition to their responses, each student's enthusiasm and desire to work effectively as part of a team were also taken into consideration.

During the interview, each student's enthusiasm and desire to work effectively as part of a team were also considered.

Those students selected to participate in the Food For Thought program were notified of their acceptance and began participating on October 31, 1994. A Home-Student-School Agreement was completed for each student and had to be signed by the student, his/her parent(s) or guardian(s), the student's counselor, and the principal. The agreement outlined basic requirements for attendance, participation, and behavior. A copy of the Home-Student-School Agreement is shown in *Figure 3.2*.

The Food For Thought group consisted of seven females and two males. The grade level make up included four juniors, four sophomores, and one freshman. This program was developed to serve special populations students and included students with emotional disturbances (4), learning disability (1), and those in at-risk situations (4). Of those considered at-risk, most students were habitually truant.

VALP Team Information

According to the program requirements outlined by the Center on Education and Work, a Vocational Academic Learning Program (VALP) team was outlined. This team included three academic staff; three vocational staff; representatives for disabled, at-risk, and minority students; and a primary contact person. The members of the original VALP team are listed below.

Kathy Powers - Food Service

Mary Hallweg - Computer Concepts

George Roth - Business Concepts

Julie Baio- English

Dan Reierson - Math

Dan Tess - Science

Noelle Sapiro - ED Teacher, Disabled Student Rep., Project Director

Vicki Blomberg - At-Risk Coordinator, At-Risk Student Rep.

Connie Mudore - Guidance Counselor, Minority & Equity Issues Rep.

Colleen Roth - Project Teacher, Contact Person

Tom Andres - High School Principal

The original VALP team consisted of three academic teachers, three vocational teachers, and representatives for disabled, at-risk, and minority students.

Figure 3.2
Food For Thought Home-Student-School Agreement

Food For Thought's overall goal is to provide each student in the program with an alternative opportunity to find academic success. The following list of shared responsibilities has been developed based on the philosophy that common agreement between everyone involved in an endeavor leads to a successful outcome. The Food For Thought program required that each student and his/her parent(s)/guardian(s) agree to these basic requirements. This contract will begin on Monday, October 31, 1994, and end on June 2, 1995.

Attendance

1. No more than all or part of ten days of unexcused absences will be permitted.
2. The student will attend daily unless physically ill.
3. Parents will notify the school when their son or daughter is absent. Call 643-5902 to reach the attendance office or 643-5940 to reach the project coordinator or project teacher.

Participation

1. Student will cooperate and communicate with their instructors, and participate in class. This includes punctuality, preparation, involvement, and completing all work to the best of his/her ability.

Student Behavior

1. Students will respect the rights of other students, staff, and property by behaving in a manner appropriate to a school setting.
2. Staff will respect each student's right to be an individual within the school environment and provide a safe, healthy environment for learning for all students.
3. Students will not sell, possess, use, or be under the influence of alcoholic beverages or illegal or controlled substances during the school day.

I have read and agree to comply with the above requirements and expectations of Food For Thought as outlined in the student handbook. I understand that noncompliance with the Sauk Prairie School District rules, regulations, and policies governing the above categories and conduct while at school which negatively affects the educational process may result in student dismissal from the Food For Thought program.

Student Date

Parent or Guardian Date

Project Coordinator Date

Project Teacher Date

Counselor Date

Principal Date

The most involved members of this VALP team were the Project Teacher and the Project Director who also served as the Disabled Student Representative. These teachers collaborated on a daily basis to meet the needs of the Food For Thought students. The food service teacher was also involved regularly to teach the Food Service curriculum. For various reasons, the other VALP team members had limited involvement in the project throughout its first year. Increasing the involvement of teachers from the other disciplines is a primary goal as the project continues.

"Integrated vocational and academic learning applies meaningfulness to academic courses by applying that knowledge to real life experiences..."

▲ *Teacher Colleen Roth, (left) and Project Director Noelle Sapiro (right) worked closely together on a daily basis.* ▲

Project Goals

The goals of the Food For Thought (FFT) program were developed by the VALP team to incorporate their team's concept of integrated vocational and academic learning, which states, "Integrated vocational and academic learning applies meaningfulness to academic courses by applying that knowledge to real life experiences. It also bridges the gap between school and community, therefore, enhancing the students' ability to become productive members of the working world." Specific program goals included:

Program goals were developed to enhance the students' ability to become productive members of the work force.

1. To provide a diverse experience which will enable students to experience success and improve their self-esteem, confidence, and motivation.
2. To teach students necessary employability skills through restructured, vocation oriented, academic and social skill courses.
3. To establish a diversified work experience which will utilize and enhance employability skills.
4. To show students the value of education in life by applying knowledge attained through school employment.

5. To increase student attendance and grades and decrease the number of discipline referrals.
6. To increase student ability to work as a team and carry out various levels of responsibility.

▲ *Students Tena Shelby (left), Jessi Brown, and Eric Dohm (right) work together to prepare table favors for a Thanksgiving party catered by Food For Thought.* ▲

The primary focus of the project was to provide relevant, restructured learning activities for students which would allow them to acquire employability skills and academic competencies, while also developing a desire to learn and finish high school.

Project Design

The Food For Thought program was designed to provide an alternative learning environment for special populations students who were habitually truant or planning to withdraw from school. The primary focus of the project was to provide relevant, restructured learning activities for students which would allow them to acquire employability skills and academic competencies, while also developing a desire to learn and finish high school.

Students participated in regular or special education programs during the first quarter and began participating in the FFT program on the first day of the second quarter. In the alternative setting, each student spent the entire school day with the FFT teacher and the other eight program participants. Unlike the previous quarter, students did not move from class to class, or change subjects according to the traditional forty-minute class periods. Instead, the various content areas were integrated through various assignments and activities.

Students earned six credits for their participation in the program. These credits were earned in the following content areas: consumer math, English, social studies, physical education, science, and food service. Assignments in each subject area focused on the practical application of competencies and allowed students to see the "real life" relevance of the course material. Students were required to complete all activities outlined in each subject area in order to receive full credit. In addition to the six credits earned in the Food

For Thought program, students also had an opportunity to complete an elective credit. As their chosen elective, some students opted to complete independent study courses, while others participated in regular art classes. Sophomore students took the regular driver's education class as an elective.

In the FFT classroom, each student received a packet which included the assignments and projects to be completed prior to an indicated deadline. Packets were distributed at the beginning of a unit. Having the assignments available from the beginning allowed students to work at their own pace. Students were not required to work on certain subjects at certain times and instead were encouraged to make decisions, plan, and prioritize their own daily activities. To incorporate various learning styles, team building, and independence, students completed assignments individually, in pairs, and as a group when appropriate.

Students were not required to work on certain subjects at certain times and instead were encouraged to make decisions, plan, and prioritize their own daily activities.

Assignments focused on the various content areas and incorporated activities related to the operation of the Food For Thought breakfast program. Concepts in each of the content areas were applied to the actual business whenever possible. As a result, students were able to see more clearly the connection between their learning and their daily lives. In addition to mastering the competencies of each subject area, students were required to demonstrate positive work behaviors and employability skills by performing in various positions within the business.

Students also performed job shadowing in several local businesses. The job shadowing unit lasted for two weeks with the students shadowing from 8:00 a.m. until 12:00 noon. In groups of 2-3, students were able to complete job shadowing in various food service settings, including the hospital, restaurants, and a home delivered meal program. Students were able to see first hand the day to day operation of various types of food services. As well as the stringent health and safety requirements observed in the food service industry (e.g. gloves, hair coverings, etc.), students were able to observe the similarities and differences between each operation.

As an enhancement to the academic and vocational components of the FFT program, students also participated in the "Game of Life." Designed by the FFT teacher, this "game" required each student to simulate activities to manage his/her own bank account, obtain and maintain employment, rent and furnish a place to live, and independently support himself or herself according to the respective income for a chosen career field. All transactions were maintained using a personal computer and financial management software. Occasionally, students would be given a "zinger" card, which presented them with situations which would affect their progress in the game in negative or positive ways. Often times, these zinger cards forced students to handle unexpected or complex situations or to make difficult decisions. The Game of Life rules and sample zinger cards are shown in *Figure 3.3*.

Students were also required to keep a Food For Thought journal and complete writing assignments which centered around difficult social situations, work related issues, or thought-provoking questions.

Students were also required to keep a Food For Thought journal. The journal was used to complete specific journal assignments which centered around difficult social situations, work related issues, or thought-provoking questions. Students were asked to explain, in writing, how they would handle each situation. These assignments promoted the development of problem solving, social, and written expression skills. Student assignments and projects were kept in Project Portfolios, which the students took with them at the end of the school year. Not only will the portfolio help students to remember their involvement in the Food For Thought project, it also allows

Figure 3.3

Rules for the Food For Thought Game of Life

Pick a profession — What kind of education does it require? After graduation, find a job in the newspaper. If the wage is not listed in the paper, then call someone who is in that profession and find out the wage. Figure out what the take home pay will be after deductions — use tax tables.

Find an apartment of house — Look in the newspaper to find one that you can afford. Sketch a layout of your home. Over time, decorate and furnish your home, according to what you can afford, using magazine and catalog pictures, paint samples, wallpaper samples, pictures of accessories, etc.

Find a vehicle — Use the newspaper. Make sure you can afford it.

When you get married — Figure our your spouse's take home pay using the weekly income given and the tax tables.

Zinger cards — Follow the directions given on your card. Remember, life is never fair!

Expenses — Some expenses are basic monthly expenses and others are optional. Expenses include:

- rent/house payment
- heat
- car payment
- transportation - per week
- utilities
- food - $150 per month per person
- phone
- student loan
- property taxes for home owners -$2,000 per year (you may want to open a savings account for this)
- renters' insurance - $100 per year
- auto insurance- $600 per year
- health insurance - $20 per person/per month
- home owners insurance - $200 per year
- recreation and vacations
- clothing

Keep an accurate check register! Use Quicken. You may use these categories: housing (rent, mortgage, property tax, repairs, furnishings); utilities (lights, heat, phone); food (groceries, eating out); transportation (car payment, gas repairs, upkeep, bus fare); loan (student loan); medical expenses (includes doctors, dentist, eye doctor, chiropractor, psychiatrist, counselor); clothing (clothing of any kind); insurance (auto, home, health); and misc. expenses (things that don't fit anywhere else).

Zinger: Congratulations! You got a promotion. Add $100 per week to your gross income. Then, take out taxes. This is your net pay which will be added to your account from now on!

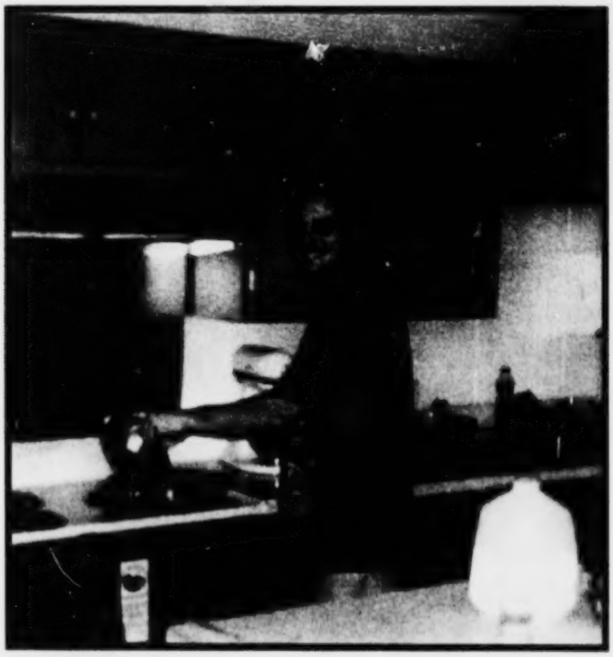
Zinger: Winter is here! You need 2 new snow tires. Write a check for $160 payable to Farm & Fleet. Deduct the same amount from your account.

them to see the progress made during the year and provides them with information, such as a resume, that may be helpful in the future.

In addition to the classroom activities, during the third and fourth quarters Food For Thought students were also responsible for the operation of an in-school breakfast business. Students would arrive early to prepare various breakfast items which were sold to other students and faculty before school and during first period. FFT students were able to further develop business and food services skills while providing others with an alternative to candy and soda for breakfast.

Students were responsible for all facets of the business, which included ordering food and supplies; developing the work schedule; preparing, cooking, and wrapping the breakfast items; advertising; serving the breakfasts and dealing with customers; taking money and making change; keeping records of the amount spent and earned; and cleaning up. Students served in each of these capacities throughout the project according to a rotating schedule, with each student having the opportunity to perform in all of the following positions: manager, head chef, assistant chef (2), general cleanup, dishwasher (2), and server (2).

Students would arrive early to prepare various breakfast items which were sold to other students and faculty before school and during first period.



▲ *Eric Dohm, as the head chef, prepares scrambled eggs.* ▲

According to a rotating schedule, each student served as manager, head chef, assistant chef, general cleaner, dishwasher, and server.

The positions involved specific duties and varying levels of responsibility. The manager was evaluated by the staff using the form shown in *Figure 3.4*. Students provided one another with helpful suggestions and feedback. They were also able to see that being the "boss" is not always easy and that each person has his/her own management style. As a result of the rotating schedule, participants became aware first hand of how difficult and challenging it is to be responsible for the operation and success of a business.

Figure 3.4

Food For Thought Manager Evaluation Form

Week of: ____________________

Manager Name: ____________________

Rate the following with 10 being great and 1 being the worst.

1. Was the manager prepared? (e.g. on time, menu, work schedule, etc.)

1 2 3 4 5 6 7 8 9 10

Comments:

2. Did the manager have the appropriate professional attitude?

1 2 3 4 5 6 7 8 9 10

Comments:

3. How well did the manager deal with conflicts?

1 2 3 4 5 6 7 8 9 10

Comments:

4. Overall, how do you think things went this week?

1 2 3 4 5 6 7 8 9 10

Comments:

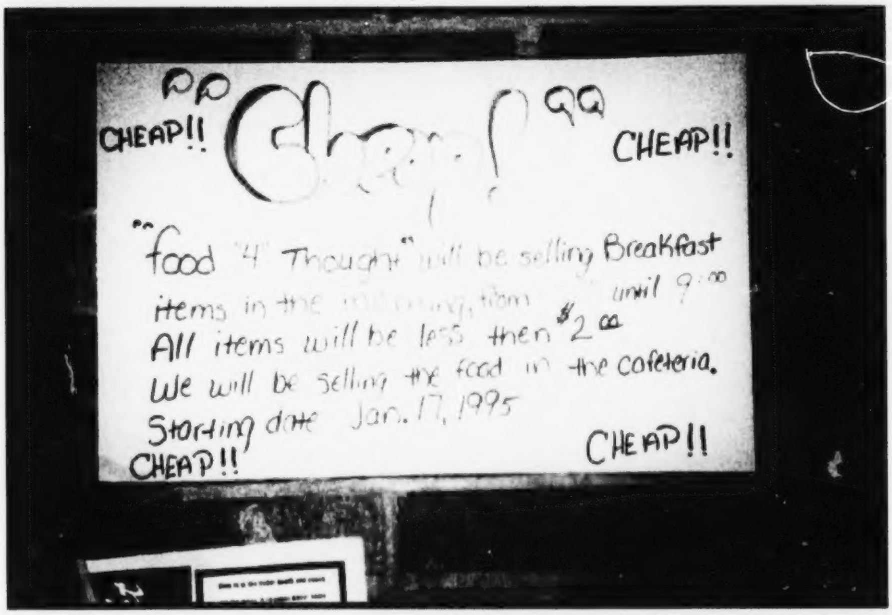
5. What improvements could he/she make next time?

1 2 3 4 5 6 7 8 9 10

Comments:

6. Any other comments, concerns, questions or suggestions?

A different breakfast item was featured each morning, and could be purchased for under $2.00. When compared to the amount of money which could easily be spent for a less nutritious breakfast from the vending machines, a healthier, and probably better tasting alternative for $2.00 or less was a good deal. The low price was also a good way to attract attention when advertising.


CHEAP!!
Cheap!
CHEAP!!
"food "4" Thought" will be selling Breakfast
items in the morning, from until 9:00
All items will be less then $2.00
We will be selling the food in the cafeteria.
Starting date Jan. 17, 1995
CHEAP!!
CHEAP!!

▲ *"Cheap!" An effective advertising strategy with students at Sauk Prairie High School.* ▲

A different breakfast item was featured each morning, and could be purchased for under $2.00.

Students in the Food For Thought program planned a weekly menu, which featured a different item each day of the week. One of the best selling items was the "Breakfast on a muffin," which was featured twice per week, once with bacon and once with ham. Menu items included the following:

Monday - Breakfast on a muffin with bacon
  An English muffin with scrambled egg, cheese, and bacon

Tuesday - Muffins and bagels with juice
  Choice of flavored muffin or bagel with orange juice

Wednesday - French toast sticks with maple syrup

Thursday - Cream cheese danish

Friday - Breakfast on a muffin with ham
  An English muffin with scrambled egg, cheese, and ham

FFT students also expanded their business to include catering and selling cookbooks and gift baskets.

FFT students also expanded their business to include catering and selling cookbooks and gift baskets. They catered two teachers' meetings and a holiday party at a local nursing home. To promote their sense of community, students helped to deliver the meals provided through the "Meals on Wheels" program and donated some of their Food For Thought earnings to charity. Through these activities students became more interested and involved in their community and also gained satisfaction in the success of their efforts.

Projects and assignments were designed to meld fragmented subject areas and provide students with meaningful, understandable learning experiences.

▲ *Tena Shelby (left) and Jodie Wieneke (right), proudly display Food For Thought catering.* ▲

Curricula and Implementation Considerations

Prior the beginning of the program, the VALP team developed the curricula for each of the subject areas. The integrated curricula were implemented by the project teacher. Each of the integrated activities was outlined according to the task to be performed, the amount of time necessary, the Wisconsin Learner Outcomes addressed, the skills needed, and the content areas integrated. Projects and assignments were designed to meld fragmented subject areas and provide students with meaningful, understandable learning experiences.

With the exception of physical education, each subject was integrated into the preparation for and operation of the Food For Thought breakfast program. The alternative learning environment allowed each subject area to be integrated with one another, as well as into the operation of the breakfast business. The competencies were developed to incorporate the academic and vocational subject matter in a way that would make sense to students. The integrated activities used in the Food For Thought program were developed by the VALP team with the hope of integrating the various subject areas while also providing students with information that would allow them to see clear connections between the academic subject matter, vocational subject matter, and their everyday experiences.

With the exception of physical education, each subject wasintegrated into the preparation for and operation of the Food for Thought breakfast program.

Physical education was presented as a part of daily life, with students participating in activities of their choice on a regular basis. Activities included independent and team sports, and also incorporated a unit on self-defense. The competencies for the other subject areas are listed below. When available, resources and additional information have also been included. In addition to the competencies, many of the integrated activities are also highlighted.

Competencies for Food For Thought Life Skills: Math

Activities will center on personal and small business finances, including

1. Basic Functions — pretest and review (addition, subtraction, etc.)
2. Wages — time cards, figuring hours worked, weekly and yearly wages, gross pay, commission/salary, overtime, payroll deductions, net pay
3. Taxes — Federal, State, FICA, Medicare, year end Federal and State tax returns, tax tables, W-2 and W-4 forms, etc.
4. Cash — adding/subtracting money, prices plus tax, multiplying money, change due, cash expenses, money orders, checking accounts, balancing a check book, saving accounts
5. Home Expenditures — costs of owning a home, financing, property taxes, insurance, utility costs, meter rates, costs of operating electric appliances, telephone bill, maintenance, etc.
6. Comparative Shopping — comparing prices, buying in quantity, comparing container size, coupons, comparing stores, discounts, sales, layaway, order blanks, shipping and handling, advertising
7. Establishing Credit — charge accounts, statements, finance charges, bank cards, available credit, etc.
8. Owning a Car — financing, cost, miles per gallon, operating costs, repairs and maintenance, depreciation
9. Budgeting — figuring income and expenditures, needs and wants, fixed and flexible expenditures, monthly budget, planned and unplanned expenses, etc.

In addition to using the PASS text, students maintained "Game of Life" accounts as part of the math curriculum.

Resource(s):

Consumer Math - PASS Program book
    Revised by Central Stream PASS/Mini PASS Program
    Wisconsin Department of Public Instruction
    Frank Kazmierczak, Program Coordinator
    Gillett, WI 54124
    Note: Used entire book and all assignments.
Quicken software
Checks and checkbook register for tracking assignments
Teacher developed assignments (see *Figures 3.5 & 3.6* for examples)

☐☐☐

Competencies for Food For Thought Science

This science class revolves around the science of food and meets many of the MATC competencies listed for their culinary arts program.

Nutrition

- ☐ Summarize the importance of the recommended dietary allowances (RDA)
- ☐ Outline the seven U.S. dietary guidelines
- ☐ Explain the food pyramid and the exchange lists

(Text continued on page 108)

Figure 3.5

Teacher Developed Math Assignment

Food For Thought: Federal Income Tax

Name:______________________________ Date:____________

For these problems, find the federal income tax.

1) Total income $6,445.00. Tax for single person ____________

2) Total income $10,930.00. Tax for single person ____________

3) Total income $18,960.00. Tax for married filing jointly ____________

4) Total income $24,960.00. Tax for head of household ____________

5) Total income $28,655.00. Tax for married filing separately ____________

6) Total income $33,200.00. Tax for head of household ____________

7) Total income $40,755.00. Tax for single person ____________

8) Total income $45,320.00. Tax for married filing separately ____________

9) Total income $50,000.00. Tax for head of household ____________

10) Total income $56,950.00. Tax for single person ____________

11) Total income $75,850.00. Tax for married filing jointly ____________

12) Total income $94,500.00. Tax for married filing separately ____________

13) Total income $100,000.00. Tax for married filing jointly ____________

14) Total income $4,000.00. Tax for single person ____________

**This assignment was used with in conjunction with the federal tax booklet published by the Internal Revenue Service.*

Figure 3.6

Teacher Developed Math Assignment

Food For Thought: Wisconsin Income Tax

Name: ______________________________ Date: __________

For these problems, find the total income. Then look at the tax tables in your Wisconsin Income Tax booklet to find your tax for the year.

1) Salary $20,000 + interest $1,320 = total income
taxes for single person __________

2) Wage $23,480 + interest $172 = total income
taxes for single person __________

3) Commission $16,520 + tips $563 = total income
taxes for single person __________

4) Wage $13,460 + tips $5,240 = total income
taxes for single person __________

5) Salary $43,500 + interest $6,435 = total income
taxes for single person __________

6) Wage $32,680 + interest $5,200 = total income
taxes for married filing jointly __________

7) Commission $12,225 + tips $5,000 = total income
taxes for married filing jointly __________

8) Salary $64,000 + interest $7,820 = total income
taxes for married filing jointly __________

9) Wage $50,800 + interest $3,400 = total income
taxes for single person __________

10) Salary $48,300 + interest $6,250 = total income
taxes for married filing jointly __________

You guys are great students — keep up the good work!

- Describe the characteristics and explain function of carbohydrates, protein, lipids, vitamins, minerals, and water in the diet
- Outline the nutrient needs of children and adolescents
- Outline the nutrient needs of adults and older adults
- Analyze links between diet and diseases such as cardiovascular, atherosclerosis, hypertension, cancer, and diabetes
- Develop a menu for specific dietary needs
- Identify cooking methods that are more nutritious

Baking Theory

- Define the theory of baking
- Calculate ingredient cost-outs of baking formulas
- Compute increases and decreases in formulas using baker's percentages
- Describe properties of various types of flours and meals
- Describe properties of various types of sugars and syrups
- Describe properties of various types of fats
- Describe properties of various types of eggs and dairy products
- Describe properties of various types of yeast
- Describe properties of various types of chemical leavening agents
- Describe specific types of yeast products

Content in the Food For Thought science course concentrated on the science of food.

Baking Lab

- Identify various bakery products
- Demonstrate proper usage of bakery equipment
- Identify priorities and functions of major baking ingredients
- Prepare a variety of muffins using the muffin method
- Prepare a variety of quick breads using the muffin method
- Prepare a variety of sweet dough products, including coffee cakes, cinnamon rolls, and pecan rolls
- Prepare dropped cookies
- Prepare rolled cookies

Resource(s):

Kupchick, A. (1994). *Handbook for Safe Food Service Management*. New Jersey: Prentice Hall.

Mehas, K., & Rodgers, S. (1992). *Food Science and You* (2nd ed.). Peoria, IL: Glencoe Division, MacMillan/McGraw Hill.

* * *

Competencies for Food For Thought Social Studies

Activities focus on the identification and attainment of positive employability skills.

1. Teamwork — learning to work together to accomplish goals
2. Problem solving — identifying positive ways to deal with work related problems
3. Conflict resolution — learning how to overcome individual differences to obtain results

4. Written and oral expression - ability to express ideas in writing and orally

Resources:

Kimbrell, G., & Vineyard, B.S. (1994). *Succeeding in the World of Work* (5th ed.). Mission Hills, CA: Glencoe/McGraw Hill.

Josten's Employability Skills software
Josten's Learning Corporation
6170 Cornerstone Court E.
San Diego, CA 92121

Note: This software was used to generate ideas for journals. Sample journal assignments are shown below.

Food For Thought Journal Activity (Sample #1)
You have two employees who work in your office. One is very friendly and tries to please customers and makes them happy. The other one talks to customers only when she absolutely has to and is very short with them. There have been complaints about her attitude. Which employee is more valuable to you? How would you handle this situation? Would you talk to the second employee about her attitude?

Food For Thought Journal Activity (Sample #2)
You are working in a newspaper office typing whatever is handed to you. One day you are typing some folder labels when your boss comes in and tells you that he just got a lead on a great story and asks you to type up the story so far. He says whatever you are working on now can wait, this is really important. What would you do, stop what you're doing and type the report or do it later when you're finished with what you're doing now? What is the meaning of the word "diligent"?

The Food For Thought social studies course focused on social issues in the workplace.

Food For Thought Journal Activity (Sample #3)
You've been working at Pepi's Pizza Parlor for almost a year. There is a delivery position open and you would like the job. You thought you would get it because you are quiet and always do what you are told to do. When you are finished with one thing, you wait for Pepi to tell you what to do next. Pepi did consider you for the job but he decides you're not motivated enough. He didn't think you were even interested. Why does Pepi think you're not interested? Should you have told Pepi that you are interested?

Food For Thought Journal Activity (Sample #4)
You are training a new employee. Lately she has been behind in her work. She often comes in late and takes long lunches. When the boss is not around she spends a lot of time making personal calls and you're tired of helping her do her work when she wastes time. You've decided to say something to her about this. What will you say to her? Explain the importance of diligence to her. Explain how diligence affects others at work. How can she become more diligent?

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Competencies for Food For Thought Intro to Food Service

Introduction to Food Service will provide job entry skills and knowledge *that are associated with opportunities in the food industry. No former foods courses are required.*

1. Evaluates the food service industry to determine personal career interest.
2. Demonstrates basic skills, as required by occupations in the food service industry (e.g. math, communication, etc.).
3. Acts responsibly on the job, in the classroom, and in society (employability skills).
4. Begins to acquire skills and knowledge needed to adequately perform activities in the classroom and/or on the job.

Outline of Food Service Course Activities

Career Exploration

☐ History of food service industry
☐ Function of food service in society
☐ Types of food service available
☐ Occupations in food

Job Seeking and Job Keeping Skills

☐ Making a career choice
☐ Identify resources to use in job search
☐ Applications, resume, interviewing, follow-up
☐ Job legalities
☐ Personal qualities
☐ Communication skills, verbal, nonverbal communication

Many of the activities in the food service class integrated information from other content areas.

Sanitation and Food Safety

☐ Sanitation
☐ Purchasing and storage
☐ Food handling and food borne illnesses
☐ Housekeeping
☐ Insect and rodent control
☐ Safety
☐ Equipment and utensils
☐ Slipping and falls
☐ Burns, cuts, and punctures
☐ First aid, choking, CPR

Menu Planning and Nutrition

☐ Planning and using a menu
☐ Menu terminology
☐ Health conscious menu choices

Food Service Final Exam - Menu Design

Plan a menu design for one of the following food service establishments.

Type 1: Coffee Shop which serves breakfast and lunch

☐ Caters to the workers and business people in the community
☐ 24 seating capacity
☐ Located in Merrimac, Wisconsin (population 300)
☐ Open between the hours of 6:00 a.m. and 2:00 p.m.

Type 2: Restaurant which serves lunch and dinner

- 50 seating capacity
- Located on the Wisconsin River (population 2,000)
- Open between the hours of 11:00 a.m and 7:30 p.m.

Type 3: This place specializes in soups, salads and desserts

- 30 seating capacity
- Located in a shopping center
- Open between the hours of 10:30 a.m. and 9:00 p.m.

Type 4: Night Club

- 75 seating capacity
- Located in Sauk Prairie area
- Open between the hours of 4:30 p.m. and 10:00 p.m.

Type 5: This place is aimed toward the age group 13-19

- 50 seating capacity
- Located in Sauk Prairie
- Open between the hours of 11:00 a.m. and 10:00 p.m.

Students developed a menu design for their food service final exam. The menu design was graded according to overall appearance, readability, understandability, creativity, neatness, organization, and the design itself.

Organization

- Name the restaurant
- Neatness
- Easy to read and understand
- Address, phone, hours
- Prices are optional
- Creative and uniqueness
- Menu cover design

Grading - Total of 100 points

- Overall appearance — 40 points
- Easy to read and understand — 15 points
- Neatness — 10 points
- Creativity — 10 points
- Organization — 15 points
- Menu design — 10 points

* * *

Competencies for Food For Thought Life Skills English

Activities will center on personal and small business situations in English.

1. Writing Skills — nouns, pronouns, verbs, adverbs, adjectives, prepositions, sentence structure, punctuation/capitalization, spelling
2. The Writing Workshop — rewriting, drafting, revising, editing, publishing
3. Job Search Strategies — using the library, using the media, interviewing professionals

4. Job Search — newspaper classified ads, other sources of employment info, phone book, etc.
5. Letter Writing — cover letters, information letters, thank you letters, letters of complaint
6. Applying for a job — creating a resume, personal fact sheet, telephone skills, appearance and hygiene, filling out an application, interviewing techniques
7. Managing employment — review of appearance and hygiene, work attitude, following rules, working as a team, cooperation, dealing with conflict, being dependable and responsible, taking initiative, handling constructive criticism and praise, expressing concerns and expectations, communicating in the work place
8. Filling out forms — every day forms, bank order forms, consumer credit applications, order forms, reading the fine print
9. Reading critically — agreements/contracts, warranties, advertisements, special offers, reading labels

Activities in the English course allowed students to develop practical English skills which are used in personal and business situations.

Resource(s):

Starkey, M., & Penn, N.W. (1994). *Building Real Life English Skills* (3rd ed.) Lincolnwood, IL: National Textbook Company.

Teacher developed assignments.

❑❑❑

Integrated Activity Outlines

When possible, activities, assignments and projects integrated the various subject areas. Integrated activities included individual, group, and paired activities which incorporated two or more content areas. As noted above, integrated activities were planned and outlined according to the task(s) to be completed, time necessary for completion, skills needed, the Wisconsin Learner Outcome(s) addressed, and the subject areas integrated. Below are examples of the integrated activities used in the Food For Thought program. The time allotment may not be identified if the activity was to be performed on an individual basis.

Integrated activities were planned and outlined according to the task(s) to be completed, time necessary for completion, skills needed, the Wisconsin Learner Outcome(s) addressed, and the subjects integrated.

Task: Determine the pros and cons of various leasing methods and purchase plans for an automobile.

Day one: Presentation of leasing vs. purchasing. (guest speakers: dealership, finance manager, sales manager.)

Day two: Loan percent calculations, calculator use, changing percent to decimals, changing decimals to percents

Day three: Presented with a variety of leasing and purchase plans, determine the pros and cons of each plan; show ability to read and understand contracts; analyze optimum situation

Time: Three days

Learner Outcome(s): #3, #8

Skills Needed: Ability to compare and contrast, compute, analyze, communicate and negotiate.

Integration Areas: math, communications, problem solving

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Task: Your goal is to raise money for a charitable cause (to be determined by students) through a cookbook sale. You will be responsible for purchasing supplies needed and determining costs. You would also be responsible for production and sales and involved in advertising your sale.
Time: Ongoing, until goals are met.
Learner Outcome(s): #11
Skills Needed: Determining the cost of an item; making change; communication skills; problem solving; manipulative skills; profit/loss and graphing; unit cost; variable/fixed costs; and math computation.
Integration Areas: math, English, art, marketing, teamwork

Students did many integrated activities in the FFT program.

* * *

Task: You are living in the time 1890–1910 and you and the members of your group are looking at the decision to stick with the horse and buggy or purchase a new-fangled car. Investigate the benefits and hazards of each form of transportation and present your decision. Consider the following: cost, time, convenience, resources, safety, and consequences to society. Your presentation must include the use of at least three different media.
Learner Outcome(s): #15
Skills Needed: Ability to conceive social implications and conditions and perform computations.
Integration Areas: math, social studies, problem solving

* * *

Task: You and your family are about to board a spacecraft to live on a space station for a year or more. Plan the family structure, living conditions, food and clothing needed, including house plan, horticulture, are there shopping malls, etc.? Write letters and other types of communications home: e-mail, fax, video.
Learner Outcome(s): #15
Skills Needed: Design, communication, family relations, food, and clothing.
Integration Areas: science, English, social studies, art, communications, teamwork, and problem solving

Integrated activities incorporated the various subject areas into applied and/or meaningful situations.

* * *

Task: Generate the school lunch menu for one month. Stay within the budget, consider state standards on nutrition, satisfy the student body.
Time: Three to four days
Learner Outcome(s): #6
Skills Needed: Understanding of nutrition, budgeting, and technology.
Integration Areas: math, science, food service, listening, teamwork

* * *

Task: You are to investigate a career that interests you. Your research should include job requirements, possibilities for advancement, salary, how your interests and abilities tie in, job market, education, related occupations, geo-

graphic location, etc. Working with your instructor, you are to choose and schedule a job shadowing experience of at least four hours. You are then to generate a report. This report can be done in written form, oral form, a video presentation, and/or photography.
Time: Three to four days
Learner Outcome(s): #14, #16
Skills Needed: Career knowledge, researching, interviewing, note taking skills, computer skills, and self-evaluation.
Integration Areas: English, communications, employment skills

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Students were able to demonstrate decision making and problem solving skills when completing the integrated tasks.

Task: You have been selected to represent a European restaurant chain. Your job is to contact a graphics company with an idea for a logo that can be used in the following three places: a window, a letterhead, and placemats.

1. Have an example of a logo (your idea).
2. Show conversions of metrics to standard measures or vice versa for all measurements.
3. Design a cost analysis for production of the three items.
4. Investigate alternative measurement tools and list pros and cons of each in developing the graphics.
5. Write your procedure for the entire process as a summary to present to class.

Time: Two weeks
Learner Outcome(s): #4, #8
Skills Needed: Reading/interpreting directions, metric conversions, proportions, problem solving, critical thinking, and design concepts.
Integration Areas: math, science, English, computers, art, marketing, communications, listening, teamwork

☐☐☐

Task: You are a graduating student who has been offered two different positions. One job pays $6.50 per hour and includes a health care package. The second position, which does not include health care, pays $8.50 per hour. Tasks and working conditions being equal, which offer is most beneficial for your needs. Prepare and present an oral report of your decision and the reason for it.
Learner Outcome(s): #3, #14
Skills Needed: Employability skills, communication skills, research, math, listening, and ability to draw conclusions.
Integration Areas: math, problem solving

☐☐☐

Task: You are a consumer. You need to purchase a gallon of milk. The supermarket has two kinds of milk available. One kind was obtained from a cow injected with BGH. The other was produced without BGH. Both are from a small company and cost the same. Which one would you choose and why? Defend your answer with a written essay.
Learner Outcome(s): #3
Skills Needed: Research and comprehension skills.

Integration Areas: science, English, problem solving

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Task: Develop a budget dependent on the income of a randomly obtained occupation. Draw out of a hat your income for one year. Now, determine the car you want to drive, where you are going to live, etc. Investigate rent costs, car loans, food costs, entertainment, etc. Do you make enough money to live a life-style that is comfortable?
Time: Two to three class periods
Learner Outcome(s): #3
Skills Needed: Understanding of basic math, career awareness, and relevance of course selection.
Integration Areas: math, social studies, employment skills

□□□

Some integrated activities were ongoing while others were shorter in duration.

Task: You are a restaurant owner who wants to upgrade your kitchen. Your budget cannot allow a total cost of more than $10,000. Your task is to redesign the kitchen. First, determine placement of appliances and determine work triangle. Then, determine the deciding criteria for cabinet possibilities. Explore various companies to compare/contrast the cupboards that best fit your budget and criteria. Using basic blueprint forms, finalize the layout, drawing a scale floor plan and specifications of cabinets ordered.
Time: One week
Learner Outcome(s): #3
Skills Needed: Calculating costs; ability to gather, analyze, and organize data; brainstorming; library research; writing; self-evaluation; recognizing people's basic needs; critical thinking; and problem solving.
Integration Areas: math, art, problem solving

□□□

Task: You are the sole source of income, married, and have three children, one of which is entering high school. You are currently working 40 hours per week and are paid $9.00 per hour. You can opt to take health insurance or not. Your portion of the insurance would be $100.00 per month. You also have a savings account of $1,000. You must design a budget that will cover all necessities for you and your family for a month. Expenses should reflect prices in the Sauk Prairie area today. Be wise with your money. Unforeseen expenses might occur.
Time: Ongoing project
Learner Outcome(s): #3
Skills Needed: Calculating costs; ability to gather, analyze, and organize data; brainstorming; library research; writing; self-evaluation; recognizing people's basic needs; critical thinking; and problem solving.
Integration Areas: math, social studies, problem solving

□□□

Task: Many home owners have problems removing gum and fruit juice stains from carpets. They try commercial rug shampoo, which often fails.

Research methods of removing stubborn substances from carpets. Describe the chemical and physical principles involved in each method. Also, test each method.

Develop a written report on your results.

Learner Outcome(s): #2

Skills Needed: Observing, analyzing, brainstorming, researching, and evaluating the best application or methods of removing stains from carpets.

Integration Areas: science, English, problem solving

* * *

Task: Yesterday, you developed a generic resume. Today, you will look through the employment ads that are available here and find one that is in line with your career plans. Using the ad, you are to revise your resume to meet the requirements of the job. At this time, it will be necessary to include your career goal.

Learner Outcome(s): #2

Skills Needed: Decision-making, organizational, and computer skills.

Integration Areas: English, computers, communications, employment skills

Students worked individually, in pairs and in groups when completing integrated activities.

* * *

Task: Create a 60 second commercial promoting the positive or negative selling points of one of their parents' career or a breakfast product.

1. Decide which clothing styles, colors, etc. will create the psychological climate to promote your selling point.
2. Design and create the set that will capture the attention of the viewer, inform them of what this entails or products the career creates.
3. Write a script for persuasive speaking, pointing out the positive and negative points of the career.
4. Use video technology to film the commercial using dubbing, close-up, and presentation skills.

Learner Outcome(s): #2

Skills Needed: Analysis and brainstorming.

Integration Areas: English, marketing, communications, employment skills

* * *

Task: Because of increased concern over lack of space in landfills, it would be desirable to develop alternate ways of serving lunch, eliminating much of the waste materials. In groups of four, examine the typical a la carte lunch and its packaging. List several alternate ways of serving the food. Then, take one of these alternatives and examine its pros and cons.

Time: One class period

Learner Outcome(s): #2

Skills Needed: Knowledge of which materials can be currently recycled, cost factors for materials used, and efficiency needs in food service.

Integration Areas: math, science, teamwork, problem solving

* * *

Task: You are a modern-day storyteller. You need to choose a traditional folk or fairy tale and revise it to reflect our existing world. Concentrate on the changing attitudes toward social issues such as sexism, technology, and violence. Rewrite the story.
Learner Outcome(s): #2
Skills Needed: Elements of a story (characterization, setting, plot, theme, moral); composition skills; oral communication; and basic mechanics of writing.
Integration Areas: English, social studies, computers

* * *

Task: You are purchasing an $18,000 vehicle. Your options include the following: 1) take a $1,000 rebate or 2.9% interest, or 2) get a loan from a bank at 7% interest with length of loan at 4 years. Then, revise the above by changing the loan period to 3 years.
Time: One to two class periods
Learner Outcome(s): #2, #3
Skills Needed: Consumer math, computing, analysis and comparison skills.
Integration Areas: math, problem solving

These activities often incorporated "real life" problem solving, such as how to make long distance phone calls most economically.

* * *

Task: The student will be able to determine the best deal for time of use in making a long distance phone call. For example, Sam calls his girlfriend in Michigan between 8:00 a.m. and 4:00 p.m. at 25 cents a minute. He could call her between 4:00 p.m. and 11:00 p.m. for 20 cents a minute. He could call her between 11:00 p.m. and 8:00 a.m. for 10 cents a minute. He has only $20 per month to spend.

1. When can he call her most economically?
2. How much time can he have to speak to her for each time period?
3. What might be a problem with getting the best deal? (works night shift)
4. Are there other ways to save money or talk to his girlfriend?

Time: One class period
Learner Outcome(s): #3, #2
Skills Needed: Knowledge of independent living, reading, math, survival, and technology.
Integration Areas: math, communications, problem solving

* * *

Task: The class will be divided into equal groups. Each group will grow bacteria under different conditions. The bacteria will be analyzed according to preestablished criteria. Each group will interpret the results and report them to the class.
Time: Three class periods
Learner Outcome(s): #11
Skills Needed: Writing skills, analytical thinking, and team work.
Integration Areas: English, science, communications, teamwork

* * *

Employability skills, working together, and being responsible were consistent expectations in the Food For Thought classroom.

Task: You are an owner-operator of a small restaurant. You have just hired two new employees. After 30 days of employment you need to determine which employee (or both) is contributing and making a profit for your business. To do this, you need to develop a job performance evaluation form which must include a criteria list, and the criteria must have a description for employees to review. Criteria should at least include employee output and business expectations.
Learner Outcome(s): #1, #3
Skills Needed: Analytical thinking.
Integration Areas: English, social studies, problem solving

❏❏❏

Task: Given previous concession data concerning product, price, and profit, develop a spreadsheet that shows items and average profit based on total concessions to date. Calculate profit increase if price per item were raised five cents and ten cents. Do a brief written evaluation which should include your profit observations based on spreadsheet statistics. Show how this project can be used to predict outcomes of changed prices.
Time: Two class periods
Learner Outcome(s): #2
Skills Needed: Ability to predict and estimate; knowledge of averages, formulas, computer applications, and spreadsheets. Ability to write a brief evaluation of the project.
Integration Areas: math, English, computers

❏❏❏

Alternative Learning Environment

The alternative setting permitted students to make choices and decisions about the structure of their class time. For example, students opted to complete all math units during the second quarter. Some of the students disliked math and wanted to "get it over with." However, through the practical exercises they were able to see the immediate relevance of math to their lives, as well as how they would need math skills to operate the breakfast business. Given this, students showed a desire to learn the math concepts so they could use them to operate their business.

At the beginning of the program, each FFT student was administered an interest survey and a learning styles inventory.

As long as the students turned in assignments on time and were actively involved in completing their work during class time, they were allowed to choose independently which subject they would concentrate on. While performing group activities, students were required to participate in order to receive credit. Employability skills, working together, and being responsible were consistent expectations in the Food For Thought classroom.

Meeting Students' Individualized Needs

At the beginning of the program, each FFT student was administered an interest survey and a learning styles inventory. These instruments were used to assist the FFT teacher in focusing on the students' interests, and more importantly, their preferred learning styles. The course work was presented in various modalities to address various learning styles. The alternative program design allowed the FFT instructor to use various activities to incorporate the various learning styles of the group.

The *Career Interest Survey* was used to assess the interests of the Food For Thought students. Results indicated diverse interests among the group with the peak areas of interest for each student being different. Some areas of high interest included artistic, scientific, plants and animals, protective, mechanical, industrial, business detail, and accommodating.

Results of the *Learning Styles Inventory* again indicated which of the following forms of gathering information, social working conditions, and expressiveness preferences were displayed by the group of students. Individual differences among the students were noted. However, as a group, there did seem to be a preference for gathering and receiving information through auditory language, with six of the nine students showing preference for learning through hearing spoken words. Five of the nine students also demonstrated preference for social/group work as opposed to working individually. However, one student seemed to prefer working independently. In terms of expressing themselves, the group seemed to show a tendency to communicate through written expression with eight of the nine students showing at least minor use of this mode. One student showed major use of written expression. Overall, there were some similarities among the students and some very apparent differences. Results were used to identify each student's preferences in order to allow each student to learn according to his/her preferred learning style.

Depending on the individual needs of the students, time outs, alternative assignments additional challenges, group activities, and repeated assignments were used to enhance student success.

Several of the FFT students were referred to the program by teachers from other programming areas. Individualized Educational Program Plans were developed to identify and address the individual needs of students. A sample of a Food For Thought student's IEP is shown in *Figure 3.7*. Students were able to address emotional issues within the classroom as outlined on their IEP's. When necessary, students were able to request "time out" rather than feeling the need to be absent on an unexcused basis. Some students also obtained outside support from counselors when necessary.

Various methods of evaluation were used throughout the program and included self evaluations, peer evaluation, and teacher evaluation. Using the results of the interest inventories and learning styles inventories, the project teacher was able to present and request information in various forms and incorporate the diverse learning styles in the group. Course work incorporated various activities including hands on, group, individual, written, and performance. The variety in activities allowed each student an opportunity to perform well according to his or her individual strengths. Depending on the individual needs of the students, time-outs, alternative assignments, additional challenges, group activities, and repeated assignments were used to enhance student success.

The competencies of the Food For Thought program were designed to parallel the requirements of the Food Service Programs at Madison Area Technical College (MATC).

Developing a Transition from High School

The competencies of the Food For Thought program were designed to parallel the requirements of the Food Service Programs at Madison Area Technical College (MATC). Discussions between staff from MATC and the Food For Thought program have been conducted in the hope of creating a formalized articulation agreement between these two schools. To date, no formal agreement has been finalized, as MATC has indicated a preference for hav-

(Text continued on page 124)

Figure 3.7

Sauk Prairie Schools Individual Education Program

Student Name: "Joe Schmoe" ***(Identity of student has been changed)***

Date of Birth: 01/01/78

Current Age: 16 years 10 months

Gender: Male

Grade: 10

Race/Ethnic (if provided by parents): White

Parent or Legal Guardian: Mr. Bob Schmoe
Route 2 Box 4848
Sauk City, WI 53583

Telephone: 643-0000

Resident District: Sauk Prairie School District

District Providing Service: Sauk Prairie School District

Amount of Exceptional Education Required

Joe will be involved in an alternative education program which will address the content areas of English, science, math, social studies, phy. ed., and elective credit in food service. His participation in this program will be 100%.

Exceptional Education Services

Services: Emotionally Disturbed
Beginning Date: 11/03/94
Ending Date: 11/03/95
Frequency/Duration: Daily
Medical Precautions: None

Extent to Which Student Will Participate in Regular Education Programs

Joe will not be involved in any regular programming in order to be involved in the Food For Thought program. Physical education and vocational education will be specially designed also. The IEP is for the regular term only.

Participation in Standardized Testing

Third grade reading test: No
Competency based testing: Yes
Achievement testing: Yes

Justification for Removal from Regular Education or Environment

Although Joe has the intelligence to do well in the regular environment, he has severe anxiety, anger, and depression which interfere with his functioning.

The district does not discriminate on the basis of race, sex, religion, handicap, national origin, creed, color or political affiliation.

Figure 3.7, continued

Sauk Prairie High School Individualized Education Program

Page 2 of 4

Name of student "Joe Schmoe"

Present levels of educational performance

At times, this student withdraws from participation in classroom activities. Joe also has difficulty interacting with fellow students and teachers when feeling agitated and does not appropriately express emotions.

Annual goal

Joe will participate in classroom activities. He will learn coping strategies to control anger and anxiety levels.

Short-term objectives	Evaluation		
	Objective criteria	Procedures	Schedule
1) Joe will identify when he feels uncomfortable due to preoccupation, anxiety and/or anger.	80%	Life Space/ Interview	Per Incident
2) Joe will learn relaxation techniques to control his anxiety.	80%	Project Skills Class/Teacher Consultation	Daily
3) Joe will develop the ability to maintain composure in a situation rather than withdraw.	50%	Self Observation & Monitoring/ Teacher Consultation/Teacher Monitoring	Weekly

Specific special education & related services which will contribute to meeting this goal:

ED Programming

Action taken on this goal at IEP review: Date: 11/94

Figure 3.7, continued

Sauk Prairie High School Individualized Education Program

Page 3 of 4

Name of student

"Joe Schmoe"

Present levels of educational performance

Due to anxiety and difficulty dealing with various emotions, including high levels of frustration, Joe has difficulty functioning in his regular and special courses.

Annual goal

Joe will participate in an alternative program to earn credits toward graduation.

Short-term objectives	Evaluation		
	Objective criteria	Procedures	Schedule
1) Joe will participate in the Food For Thought program.	100%	Program Teacher Monitoring	Throughout 94-95 school year
2) Joe will perform required tasks/activities and complete required work to receive 6 credits.	100%	Program Teacher Progress Reports	By June '95
3) Joe will complete P.A.S.S. work in order to receive an additional credit in the area of science.	Completion of P.A.S.S. program in biology	Independent Work/Teacher Monitoring of Progress	By June '95
4) Joe will identify when he is experiencing difficulty in an area or subject and will express this to his teacher(s).	100%	Teacher Monitoring/Self Monitoring	Per Incident

Specific special education & related services which will contribute to meeting this goal:

ED Programming; Transition Services

Action taken on this goal at IEP review:

Date: 11/94

Figure 3.7, continued

Sauk Prairie High School Individualized Education Plan

Page 4 of 4

Name of student

"Joe Schmoe"

Present levels of educational performance

Behavior Management

Annual goal

Behavior Management

Short-term objectives	Evaluation		
	Objective criteria	Procedures	Schedule
1) Discipline for Joe will be handled through ED programming and school policies. It will consist of time outs, conflict resolution, and problem solving techniques followed by appropriate consequences.	100%	Conflict Resolution/ Teacher and or Administrator Consultation	Per Incident
2) Any behaviors endangering the health and safety of others or self may result in an out of school suspension.	100%	ED Teacher/ Administrator Consultation	Per Incident
3) Failure to work through time outs, problem solving and resolutions will result in the following: parent contact; leaving the building without permission will be considered truant unexcused; detentions and in-school suspensions may be used; police and or social services may be contacted; proper physical restraint may occur if necessary.	100%	Conflict Resolution/ Parent Involvement/ Outside Contacts	Per Incident

Specific special education & related services which will contribute to meeting this goal:

ED Programming

Action taken on this goal at IEP review

Date 11/94

ing the new program establish itself, prior to the development of such an agreement.

Students did visit MATC, and were able to obtain information about the food service programs and other programs of interest. Since the beginning of the Food For Thought program, there has been a significant increase in the number of students expressing a desire to pursue postsecondary education.

Results

The primary goals of this project were to show that implementing an alternative, integrated curriculum would improve attendance, behaviors, and academic achievement. For the sake of comparison, a control group and an experimental group were identified, with the experimental group being the Food For Thought students. The number of unexcused absences, number of discipline referrals to the vice principal, and the percentage of failed courses were monitored for each group. Information was collected and compared for each quarter of the 1994–1995 school year. The Food For Thought program did not reach full operation until the second quarter; therefore, first quarter data represent "before" or pre-project numbers. Post-project or "after" effects of participation in the program are represented by the data gathered in second, third, and fourth quarters.

Since the beginning of the Food For Thought program, there has been a significant increase in the number of students expressing a desire to pursue post secondary education.

When comparing attendance records of the two groups, the control group had a total of 302 unexcused class periods during the first quarter. This number increased to 305 in the second quarter, dropped slightly to 265 in the third quarter, and peaked at 339 in the fourth quarter. The integrated group had 164 unexcused class periods "before" which decreased to 3 in the second and third quarter, and rose to 98 in the final quarter. According to teacher reports, the number increased in the fourth quarter due primarily to attendance and personal issues of two students.

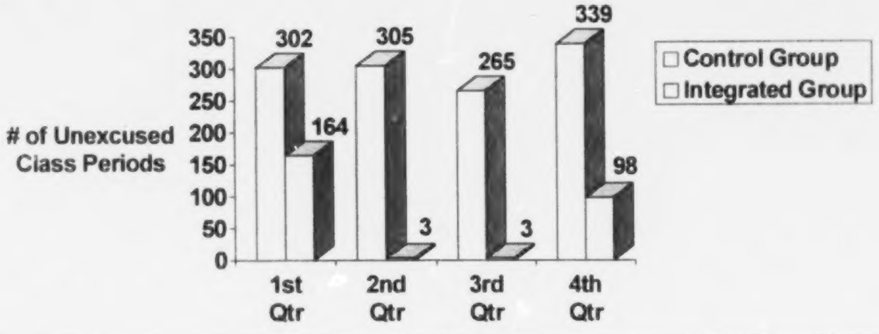
The number of discipline referrals decreased in both groups with a reduction from 29 to 5 in the control group, and a reduction from 12 to 0 in the integrated group during the second quarter. Discipline referrals dropped to 0 in both groups during the third and fourth quarters.

Academic achievement was measured in terms of the percentage of failed courses. Prior to involvement in the Food For Thought project, the experimental group failed an average of 57.4% of their classes while the control group failed an average of 53%. Again, improvement was noted in both the experimental integrated group and the control group with the percentage of failed courses being 0% and 31.1%, respectively, during the second quarter. During subsequent quarters, the percentage of failed courses remained at 0% for the integrated group, and was noted at 33% and 40% for the control group.

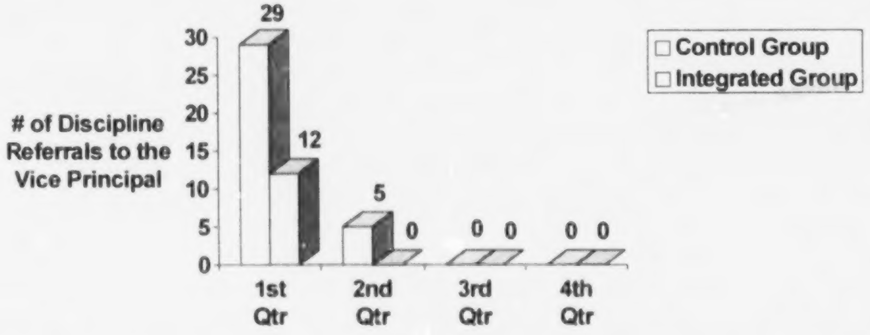
Using the graphs shown in *Figure 3.8,* one can see improvements in attendance, behaviors, and academic achievement for the integrated group. Improvement in behaviors and academic achievement are also noted for the control group. It should be noted that two of the nine students in the control group withdrew from school, leaving seven students in the control group. This may account for a decrease in the number of discipline referrals, as one of the withdrawing students accounted for 11 of the original 29 discipline referrals for this group. However, the number of absences for the control group did not significantly decrease when the attendance records of these two students

Figure 3.8
Food For Thought Control Group Comparisons

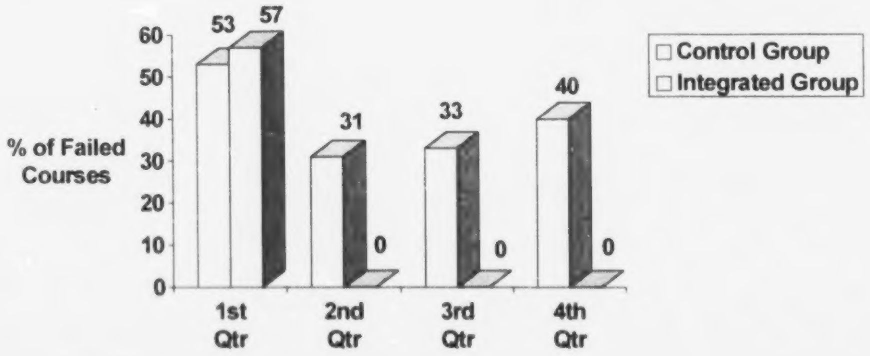
Comparison of Student Attendance



Comparison of Student Behaviors



Comparison of Student Achievement



Note: First quarter (1st Qtr) data represent the pre-project numbers. Second, third, and fourth quarters represent data collected after the project's implementation (post-project).

were no longer being tracked. Academic achievement did not appear to improve significantly in the control group.

Seventy-eight percent of the Food For Thought students made the honor roll during second quarter. One student commented, "Everybody has something to talk about at home now, our grades are so good." Students seemed to have very positive feelings about the success of the program's first year and were actively involved in advocating for continuation of the program. Parents were also willing to express their positive feelings about the program and wrote letters and made phone calls to show their support of Food For Thought. One mother wrote a touching letter in support of the program which discussed the opportunity FFT had given her daughter and stated that involvement in the program had been a "turning point" in her life.

Summary

The Food For Thought breakfast program was profitable in its first year, earning approximately $1,400.00. Students chose to give some of their earnings to charity and used the remaining funds to take a trip to the Shedd Aquarium and Great America in Chicago, Illinois. Although the trip was a major highlight for the Food For Thought students, they also reported other highlights including having enough credits to graduate, having the desire to continue with school, improved grades, beginning to like school, getting personal attention, being able to get along with others, and learning to handle anger in a responsible way. Overall, students were very positive about the program and expressed a strong desire to see the program continue. In fact students were actively involved in efforts to gain the school board's support for continuation of the program. Students wrote letters and made oral presentations to show their support for the program. The program will be continued in the coming year.

According to teachers, a new sense of self-esteem and confidence was observed in many of the FFT students. Students once considering dropping out made decisions to stay, and the number of students expressing interest in postsecondary education increased, as well.

In addition to the positive comments from the students, there were also positive results in the areas of attendance, discipline referrals, and academic achievement. Students demonstrated increased motivation to be in school and learn. According to teachers, a new sense of self-esteem and confidence was observed in many of the FFT students. Students once considering dropping out made decisions to stay, and the number of students expressing interest in postsecondary education increased, as well.

Recommendations for Replication

As with any new program, the Food For Thought program faced some difficult challenges and obstacles during its implementation. Below are some of the difficulties and challenges identified and recommendations for consideration in future replication of similar projects.

Lack of involvement from all VALP team members. Only three of the initial VALP team members identified were actively involved in the project on a consistent basis. This created a great deal of work for these three members and often put them in a position to serve in capacities beyond their expertise. Having a committed, actively involved VALP team with representatives from the academic, vocational, and student representative areas would be highly recommended.

Limited support from school administrators also made it difficult to recruit staff members during the initial phases of the project. Strong support from administrators is highly recommended. Beginning a new project is difficult, having committed administrative support from the beginning of the project will create a more optimal condition for success.

Clearly defined, consistently enforced consequences for inappropriate behaviors need to be established in writing. Although planned, a student handbook was not developed and would have been helpful to address questionable behavior issues.

Predetermined competencies for all subject areas should be developed and should also include the method of evaluation to be used when determining whether or not the competencies have been met. Having this information available can counteract questions regarding "watered down" subject matter.

Despite a few challenges, the program experienced a great deal of success in its first year. Teachers, students, administrators, parents and the community were able to see the benefits not only of a good breakfast, but of Food For Thought. They will continue to see these benefits as the program continues and evolves.

Teachers, students, administrators, parents and the community were able to see the benefits not only of a good breakfast, but of Food For Thought.

Water Quality Analysis Project

4

Developed and conducted by the VALP Team of Spooner High School
Compiled by John Gugerty, Center on Education & Work

Key Features

Focus

This project used water quality analysis as the theme around which all students in Chemistry II (Advanced Chemistry) worked as part of two-person teams with all students in the Natural Resources class. Over the course of the school year, these teams collected and analyzed a series of water samples from the Yellow River which flows through Spooner and the local sewage treatment plant. Analyses included those for coliform bacteria, dissolved oxygen, phosphates, nitrates, pH, and turbidity.

Organizational Framework for this Effort

The Spooner School District's organizational structure provides a critical framework that facilitates effective educational and support services to Exceptional Educational Needs (EEN) students and other students who learn differently or with difficulty. That organizational structure also provided the nurturing environment that allowed participating staff to design, develop, and carry out the Water Quality Integration Project, an effort that required substantial revisions in scheduling, course content, and staff roles. Key parts of this framework include:

- a formal, board-approved inclusion policy for students with disabilities and other special needs in all courses and activities;
- a comprehensive strategy, known as the Designated Vocational Instruction approach, that staff use to provide academic support for special education students enrolled in both vocational and academic classes;
- the "Breakfast Club," an informal, yet regular, gathering of teachers and other staff once a week prior to the start of the school day in order to discuss issues, brainstorm solutions to problems, and provide mutual support to participants; and
- intense planning and preparation during the summer of 1994 carried out by Spooner High School staff, directed and facilitated by CEW staff, and supported by $44,000 in funds provided through the federal grant underwriting the overall project to integrate academic and vocational education in ways that effectively include students with special needs.

The Spooner School District's organizational structure provides a critical framework that facilitates effective educational and support services to Exceptional Educational Needs (EEN) students and other students who learn differently or with difficulty.

Real World Connection

As students determine the possible impact of Spooner on the quality of its waterway, the Yellow River, as well as the impacts of its sewage treatment

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plant and new fish hatchery (the largest in the world), the project has the potential to influence the local community and its chief industry, tourism. Water quality data collected over the years by this project will serve as a base line to determine the possible impact of new residential or business developments on the area's water quality.

Demographic Information

The natural resources and advanced chemistry classes were the primary focus of the integration effort.

Spooner is a small rural community located in northern Wisconsin, within the Cooperative Educational Services Agency (CESA) #11 district. There is little industry, and tourism is the major economic source. The Yellow River flows through town and the area is highlighted by many lakes which promote fishing, boating, hunting, and other recreational activities which drive the tourism industry. Currently, the Department of Natural Resources is expanding the fish hatchery in Spooner. Because this fish hatchery will be the largest of its kind in the world, it is also expected to strengthen the local tourism industry. The school district has a total of 1,700 students in grades K-12. There are approximately 500 high school students attending Spooner High School.

Ten percent of the student body is Native American, 30% can be classified as at-risk with special needs, and 15% are young teenage women raising babies and going to school.

During the 1994-95 school year, Spooner High School followed a traditional schedule in which students were taught by different teachers in different locations, subjects (other than those involved in the project) were not connected, and students moved from room to room. Teachers prepared for up to six different classes per day. There was no curriculum specialist or director of curriculum/instruction to guide curriculum change efforts, and teachers had little opportunity to collaborate on curriculum development prior to their participation in CEW's Integrating Academic and Vocational Education (IVAE) project. Vocational departments have only one teacher each, except for Family and Consumer Economics.

Historically, most of the students enrolled in the Natural Resources class were classified at-risk or were low achievers. Chemistry II students were usually college-bound, high academic achievers.

Spooner High School began using a block schedule during the 1995-96 school year. The staff's positive experience during this integrated project provided support, in part, for the decision to change to block scheduling. The Water Quality Analysis integration effort was continued and expanded during the 1995-96 school year.

Participant Information

The Natural Resources and Chemistry II classes were the primary focus of the integration effort. The Natural Resources course is taught by the agriculture instructor, with an initial enrollment of 19 students. Most of the students enrolled in the Natural Resources class were male, with 16 males and 3 females. Historically, most of the students enrolled in this class are classified at-risk or are low achievers. The Chemistry II students tend to be college-bound, high academic achievers. Initial enrollment in the Chemistry II class was 25, and included 9 males and 16 females. The students in these vastly different courses had very little, if any, interaction with each other prior to this integration effort. Secondary subjects involved in this project included history, English, mathematics, and computers.

VALP Team Information

Working in a team of nine, faculty from across the curriculum were given time to reflect and challenge each other's ideas at the 1994 summer workshop in Madison and during an additional 15 days of activity in their home district prior to the start of the 1994-95 school year. During these work sessions, VALP Team members determined what threads ran through the curriculum, and selected appropriate strategies for teaching critical elements of overlapping concepts, skills, and attitudes. This process also provided participating teachers and counselors with opportunities to discuss and decide how the Wisconsin Learner Outcomes fit within their curriculum framework. Participants also examined tech prep, inclusion, and other mandated initiatives from a cross-discipline approach, and developed "planned and continuous" instruction for all students.

VALP Team Members and Their Roles in This Project

Susie Olson-Rosenbush:	Natural Resources teacher, day-to-day contact with students, developed day-to-day lessons plans.
Larry Flynn:	Chemistry II teacher, day to day contact with students, organized field trips, water testing equipment and labs.
Dave Parish:	EEN instructor, curriculum adaptation, IEP development, direct support in Natural Resources class and combined classes.
Dick Gerberding:	Guidance counselor, involved in scheduling to accommodate project needs, scheduled team meetings and contact with outreach staff from other agencies.
Harry Hughes:	Math instructor, worked with data collected by project, computer specialist for VALP needs.
Jon Miller:	History instructor, set up the Internet system, was camera operator for video footage.
Kathy Joyce:	EEN instructor, IEP development, resource for assessment for individual and group activities as well as overall learner outcomes, direct contact with actual water testing.
Lynnea Lake:	EEN instructor, IEP development, resource for assessment for individual and group activities as well as overall learner outcomes, direct involvement with actual water testing.
Dick Rubesch:	Audiovisual coordinator, video technician, editing of film footage.

During work sessions, VALP Team members decided what threads ran through the curriculum, and determined appropriate strategies to teach critical elements of overlapping concepts, skills, and attitudes.

Dan Schullo:	History instructor, aided in setting up water tests, support for field trips, and organizing final evaluation.

Project Goals

Goals of the Water Quality Integration Project are to:

- integrate the Chemistry II and Natural Resources courses;
- enhance and further develop knowledge, awareness, attitudes, skills, and citizenship; and
- enable the students to see the relevancy of water quality to the quality of life in their own community.

This effort teamed Chemistry II students with Natural Resource students to perform water quality testing and to apply gathered information to all water quality issues.

Project Design

This effort teamed Chemistry II students with Natural Resource students to perform water quality testing and to apply gathered information to all water quality issues. The Chemistry II students led their groups in the technical aspects of water testing. The resulting data were shared to help students understand water quality issues presented in class. Water quality issues were addressed and publicized in reports and letters to the community. These writing assignments explained the project and reported the results of the study. The goal was to integrate not only the disciplines, but to integrate higher performing students with at-risk students.

Planning Process

A key factor in the success of this integration effort was the intense and extensive planning time supported by grant funds from CEW and facilitated by CEW project staff. During four days in the summer of 1994, VALP team members, along with teams from three other participant schools, worked in Madison on the plans they would complete during 15 additional summer work days in their home district. This planning and preparation period was also supported by the grant funds. CEW staff visited Spooner (and other participating sites) to provide technical assistance and monitor progress during those work sessions. At the close of this intense work period, VALP team members from all four sites again met in Madison as a group to finalize their efforts, share successes and problems, and provide mutual feedback and support.

A key factor in the success of this integration effort was the intense and extensive planning time supported by grant funds from CEW and facilitated by CEW project staff.

Figure 4.1 illustrates the Spooner VALP team's initial plan. *Figures 4.2–4.3* illustrate work sheets that the Spooner VALP team used to analyze existing curricula and instructional processes and make modifications indicated. It is critically important to understand the organizational climate and context within which this integration project was developed and implemented. That climate and context will be reviewed in the "Curriculum Considerations" section following.

It is also critical that the reader understand that a dynamic, nontraditional process such as undertaken by the Spooner team evolved as the implementation process unfolded. Thus, the initial plan *(Figure 4.1)* is not a perfect guide to the events of the integration effort as they transpired.

(Text continued on page 140)

Figure 4.1

ACTION PLAN TO DEVELOP INTEGRATED VOCATIONAL AND ACADEMIC LEARNING PROGRAMS

Spooner High School

Curricula Subjects to be Integrated

Primary: Natural Resources and Advanced Chemistry
Secondary: History, English, Math, Computers

Grade Level of Integrated Curricula

10,11,12

Length of Integrated Approach

Full year, approximately 1 day per week, 36 total days; Introductory unit: three weeks

September, November, January, March, and May - collect water in the field 1 day each of these 5 months

# of Students

Approximately 40

Objective

1. To integrate our advanced chemistry and natural resources classes.
2. To enhance and further develop knowledge, awareness, attitudes, skills, and citizenship.
3. Students will see relevancy of water quality to their quality of live.

	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Videotape	
				Yes	No
Participants: VALP Team, Administration, CESA Personnel A. Review project. B. Address individual concerns. C. Confirm calendar. D. Connect VALP grant to additional district grant. E. Address need for a brief period of time (10-15 minutes) to explain project to staff prior to students' first day. F. Discuss videotaping procedures and parent permission.	Sue Selbin Dave Parish Harry Hughes Dan Schullo	July 11		X	

Figure 4.1, continued

ACTION PLAN TO DEVELOP INTEGRATED VOCATIONAL AND ACADEMIC LEARNING PROGRAMS

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Video-tape**	
				Yes	**No**
Preliminary 3-4 week core curriculum for unit on water quality will be developed as a team:	VALP Team members	July 27		X	
Chem. II Instructor Larry Flynn					
Natural Resources Instructor Susie Olson-Rosenbush					
Resource person from Minnesota Dave Parish					
DNR contact person Dan Schullo					
Dick Gerberding		DNR Harold F.			
Clerical Kathy Joyce Lynnea Lake					
Computer support Harry Hughes					
Modifications Lake, Parish, Joyce					
Funding and documentation Sue Selbin					

Figure 4.1, continued

DEVELOPING INTEGRATED VOCATIONAL AND ACADEMIC LEARNING PROGRAMS

1. Tasks required to integrate special population students **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Video-tape**	
				Yes	**No**
Large group activity for collection (Natural Resource and Chem. II) Initially a single site with instruction (Spooner Dam)	Susie O.-R. Larry F. EEN Reps. Additional VALP members	Sept.		x	
Additional sites done with smaller groups of four Potential sites- Yellow River sites wayside east of town and Tozer Lake Road west of town Water Treatment sites-before, middle, and after Repeat of water collection one day per month at an established site listed with small groups In addition, add stagnant farm ponds and other polluted sites	Susie O.-R. Larry F. EEN Reps. Additional VALP members	November January March and May		x	

Figure 4.1, continued

ACTION PLAN TO DEVELOP INTEGRATED VOCATIONAL AND ACADEMIC LEARNING PROGRAMS

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
Analysis, synthesis, evaluation and reporting of data	Larry Susie	Ongoing			
Create charts, graphs, maps, and tables from collected data of all water sites	Harry students English Dept. other depts. as needed	Final document: June, 1995	Site information, notes, journals, computer lab, Internet	X	
Written reports of analysis, synthesis, and evaluation of data. These reports will be formal with the goal of publication of a final document.				X	
Oral presentation to community groups including but not limited to school board and staff, PTA, Lions, Jaycees, Chamber of Commerce, and students of school system.			Public meeting, radio, newspaper, TV, school	X	
Incorporate into the overall water quality curriculum as a team.	VALP team members				
Provide direct and indirect instructional support.	EEN staff with classroom instructor.	June, 1995	Designated Instructor	X	
Develop modifications and instructional strategies based on ongoing assessment of individual student needs.					

Figure 4.2

Curricular Adaptation Planning Form

Instructor

Date

Current Instructional Plan		**Do changes need to be made in:**	
Content area/subject **Estimated time** **Activity** **Materials**	**Instructional arrangement?**	**Lesson format?**	**Delivery of instruction (Teaching style/ methods)?**
	Social/physical environment or conditions, or lesson location?	**Curricular goals/learning outcomes?**	**Instructional materials?**
	Level of personal assistance?	**Does an alternative activity need to be arranged? Any other adaptations?**	

Figure 4.3

Checklist for Materials Vocational Academic Learning Plan

Layout

______ Is the appearance clean and free of distraction?

______ Is it typed or clearly printed?

______ Is there adequate white space?

______ Are the answer lines or squares generous in size?

______ Is the amount of material on the page limited to avoid overcrowding?

______ Is the volume appropriate for student ability?

______ If photocopied, is it sharp and clear?

______ Has unnecessary transferring been eliminated?

Directions

______ Are the directions clear and concise?

______ Are students familiar with terms used, e.g. “omitted” or “odd numbered”?

______ Have definitions or other details been removed and relocated elsewhere?

______ Is a complete example provided?

______ Is the sentence structure simple?

______ Are the steps to follow appropriate for students’ skill levels?

______ Does each section have its own directions?

Content

______ Is content presented in small segments?

______ Is a work bank provided when necessary?

______ Is the reading level appropriate?

______ Has far-point or near-point copying been eliminated?

______ Is the material well organized?

______ Has unnecessary verbiage been eliminated?

Testing

______ Does the test begin with an easy question?

______ Does the student have adequate time to work without feeling pressured?

______ Are recognition rather than recall questions used?

______ Does each section have its own set of directions?

______ Is “matching” grouped in small even segments?

______ Is a word bank provided for fill-in questions?

______ Can a student be tested orally or on tape when necessary?

Figure 4.3, continued

Checklist for Materials Vocational Academic Learning Plan

____ Tactile
____ Group
____ Individual
____ Other

The following areas need modifications for this student in the classroom:

____ Student's physical placement in class
____ Teacher's physical placement in class
____ Presentation of visual subject matter
____ Presentation of auditory subject matter
____ Hands-on learning/manipulatives
____ Peer interaction/cooperative learning
____ Seat work
____ Special activities
____ Mobility
____ Recitation/discussion
____ Lecture/note taking
____ Curriculum level
____ Tests
____ Homework assignments

Who will grade this student?

____ Regular education teacher
____ Special education teacher
____ Both

Behavior modifications that are necessary or work well with this student:

____ Reinforcement (specify: praise, tokens, etc.)
____ Contingency contract
____ Self-regulation
____ Time out
____ Withdrawal of privileges
____ Other

Explanation of relevant terminology

Date of initial mainstreaming placement meeting

Curricula and Implementation Considerations

To appreciate fully why this project succeeded in its first year and was continued without involvement by CEW staff during the 1995-96 school year, the reader must be familiar with the organizational climate and institutional context within which this effort unfolded.

To appreciate fully why this project succeeded in its first year and was continued without involvement by CEW staff during the 1995-96 school year, the reader must be familiar with the organizational climate and institutional context within which this effort unfolded. Key elements of this context include:

- the Spooner VALP team's concept of integrated vocational and academic learning;
- the formal policy adopted by the Spooner School District Board of Education that addresses education of students with disabilities and other special needs;
- the long-standing working relationship between special educators and their vocational education and academic education counterparts, exemplified by the Designated Vocational Instruction approach;
- the professional peer support fostered by the administration and exemplified by the Breakfast Club.

The following section will fill in this context and provide examples of what students did as part of the integrated water quality analysis project.

VALP Team's Concept of Vocational—Academic Learning

Integrated vocational and academic learning is a concept that should combine classroom material with a community's vocational and recreational offerings. The VALP team's goal is to create a project that is relevant to students' interests and environment, and also meet the students' special and diverse needs. This project may also give students an idea of possible future job opportunities connected with the project.

Policy on Inclusion

The Spooner School District Board of Education developed and formally adopted on March 15, 1993 an inclusion policy that undergirds the efforts of Spooner High School staff to meet the needs of those who learn differently or with difficulty in inclusive educational settings. That policy is also a key indicator of administrative support for initiatives such as the Water Quality Analysis Project. It states:

Students who have exceptional education needs (EEN) or are otherwise at risk for obtaining their maximum potential may require special instruction and modifications of the curriculum.

> *The strength of any community and school has a foundation in the diversity of its citizens, students, and staff. Recognizing diversity as a strength, the task of the Spooner community and school is to provide each individual the opportunity to grow and prosper to the maximum extent possible. It is the philosophy and commitment of the Board of Education that every student will be afforded this opportunity.*
>
> *To achieve this goal, all staff must be accountable for the growth of each student. Considering the range of abilities, skills, and interests of our student body, there must be a comprehensive curriculum with flexibility for staff in how this curriculum is presented and taught. This demands access,*

training, and utilization of multiple resources and techniques including conventional and alternative materials with direct and indirect instructional support. Continuous professional development becomes an obligation of the Board and all administrative, instructional, and support staff.

Students who have exceptional education needs (EEN) or are otherwise at risk for obtaining their maximum potential may require special instruction and modifications of the curriculum. To educate students with EENs, the Board embraces the concept of least restrictive environment and directs that whenever possible students should be taught in the same school and class as their age-appropriate peers. This requires options for students with mild impairments to be in the regular classroom with support, modifications, and options of a more restrictive nature when specialized instruction or curriculum is required. No student has the right to disrupt the others' education. However, students with severe behavior problems must be given the opportunity to return to the classroom when their behavior is no longer disruptive.

All decisions for students with EENs should be based on needs specified in the Individualized Educational Plan (IEP). To accommodate the diverse needs of students with IEPs, the Board recognizes and supports the following levels of intervention.

- *All students are able to learn, but not all students can achieve at a predetermined level. Therefore, no single level of expectation is appropriate for any class.*
- *Some students with EENs can learn in the regular classroom without modifications.*
- *Some students with EENs can be education with non-handicapped peers provided there are adjustments in performance standards.*
- *Some students with EENs can be educated with non-disabled peers provided there are adjustments in rate, the amount of work, methods of instruction, and/or modified materials and techniques. Support of special education staff is a resource which could be considered for helping students with EENs in the regular classroom.*
- *Some students with EENs can be best educated through classroom adjustments involving collaborative instruction.*
- *A small number of students with EENs may require both special instruction and special curriculum which cannot be carried out in the regular classroom even with the aid of other resources.*
- *Before a student with an EEN is removed from a less restrictive setting, there must be documentation that the child's needs cannot be met in the regular classroom with supplementary aids and services.*

To educate students with exceptional educational needs, the Board embraces the concept of least restrictive environment and directs that whenever possible students should be taught in the same school and class as their age–appropriate peers.

The Designated Vocational Instruction Approach

Since 1982, the Spooner High School has had excellent collaborative efforts through the implementation of the Designated Vocational Instruction (DVI) approach. Using DVI concepts, special education staff and teacher aides provide direct instructional support to EEN students and their regular education teachers in 15 academic and vocational classes per semester. Spooner staff refer to DVIs as DIs, because they provide direct in-class support to academic as well as vocational instructors.

Using Designated Vocational Instruction concepts, special education staff and teacher aides provide direct instructional support to 15 high school classes per semester.

This in–class support was another critical element in the success of the Water Quality Integration Project, because one of the key participating staff, Dave Parish, provided such support at least three times per week for students in the Natural Resources class, as well as during all sessions in which Natural Resources students and Chemistry II students were working together. Lynnea Lake and Kathy Joyce, special educators and VALP team members, also provide in-class instructional support to EEN students as part of their DVI (DI) role. This approach is one of the factors that result in a 90% graduation rate for special education students.

The DI's involvement includes:

- co-teaching;
- provision of both direct and indirect support;
- facilitation, modeling, or implementation of cooperative learning strategies; and
- facilitation, modeling, or implementation of alternative student evaluation strategies.

The following sections will describe each of these activities.

Co-Teaching

Co-teaching refers to organized, systematic support provided by special educators to vocational and academic teachers.

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Goals

1. Provide the appropriate mainstream experiences for special education students in order to maximize the students' learning potential within the regular education environment.
2. Take what we have learned from the special education programs and begin to transfer this knowledge to the regular education classroom. To form a partnership between regular education and the special education programs and blend the strengths of both systems.
3. Improve communication between special education staff and regular education staff.
4. Adapt the regular classroom to make it possible for the special education certified student to learn in that environment.
5. Reduce the number of special education classrooms in a building and maintain adequate student support.

6. Provide the experience and knowledge of special education programs for students with learning programs within the regular classroom.
7. Promote students' self-esteem and self-acceptance through positive peer identification.
8. Encourage the development of regular education classes and programs to address the needs of the slow learner.

Issues in Developing Co-Teaching

1. Participation must be voluntary for both team members.
2. Team members must have common planning time.
3. Each team must develop its philosophy and set goals.
4. Determine class size and composition, and entry and exit criteria.
5. Include a support study hall for special education students.
6. Develop an opening day explanation to students as to why there are two teachers in the classroom.
7. Establish classroom expectations, management, and the role of each team member. Determine classroom procedures, rules, behavior, and general structure.
8. Determine grading, alternate methods of evaluation, and behavior management techniques to be used.
9. Decide on an instructional pace and teaching strategies which meet the needs and learning styles of both regular and special education students.
10. Develop a format for parent/teacher conferences.
11. Discuss student and program evaluation.

This guide for the Designated Vocational Instruction Approach outlines, among other things, some of the issues in the development of co-teaching.

Duties and Responsibilities of the Regular Education Teacher

1. Lesson planning
    a. Prepare lessons in advance, with special ed teacher input.
    b. As an alternative, have plans and activities ready in advance to discuss with special ed teacher.
2. Set disciplinary rules and atmosphere.
3. Role in classroom
    a. Introduce and present subject material.
    b. Assign daily work and homework to students.
    c. Organize small group activities pairing special ed students with regular ed students.
    d. Review and supplement material.
    e. Evaluate students' social and academic achievement.
4. Modifications (as necessary)
    a. Devise and implement new teaching techniques as a team.
    b. Adjust grading in accordance with students' abilities.

5. Attend IEPs when possible; otherwise, provide written comments.
6. Conduct parent/teacher meetings with input from special ed teacher.

Duties and Responsibilities of the Special Education Teacher

1. Lesson planning
    a. Assist in preparation of daily lessons.
    b. As an alternative, review advance lesson plans.
2. Share daily disciplinary responsibilities.
3. Role in classroom
    a. Share in keeping special ed students on task, tuned in to daily activity.
    b. Share in clarifying directions and subject.
    c. Assist students in getting started.
    d. Model listening behavior.
    e. Encourage and reinforces class participation.
    f. Provide reassurance in testing situations.
    g. Evaluate students' preparedness: organization, effort, active participation, and behavior.
4. Modifications (as necessary)
    a. Assignments
    b. Tests/Quizzes
    c. Highlights key concepts in text
    d. Study guides (flashcards, page numbers)
    e. Conducts small groups for projects, drill, and practice
    f. Narrows focus on content questions
    g. Provides additional review material
    h. Tape text
    i. Peer tutoring
    j. Oral reading of material
    k. Retakes of tests and quizzes
5. Provide results of IEP to regular education teachers.
6. Update progress to parents.

The regular education and special education teachers develop an overall strategy which can be used in any discipline, as well as in their specific team class.

The regular education and special education teachers develop an overall strategy which can be used in any discipline, as well as in their specific team class.

Impact on students

- stronger emphasis on learning skills, organizations, and preparedness;
- improved self-esteem;

- diverse learning techniques at their disposal;
- more contact time with teachers for school and personal issues;
- sense of responsibility enhanced;
- an opportunity to learn through peer tutoring;
- have better understanding of students with different abilities;
- unique learning needs met to the greatest extent possible;
- more productive learning experiences;
- maximized learning potential;
- instructional pace meets the needs and learning styles of all;
- more positive attitude to self, peers, and school; and
- more time is spent working cooperatively to acquire knowledge and learn more about ways in which individuals can make positive contributions.

Support study halls have been designed primarily to provide structured organization, support, and accountability for EEN students enrolled in regular classes. Similar services are also provided for non-EEN students in regular education who need additional help.

Impact on staff

- mutual learning and appreciation for each other's area of expertise;
- more opportunities to use specialized skills in which we have been trained;
- improved student behaviors;
- more effective use of time;
- more time and energy available to help students develop motivation, effort, and a sense of responsibility for their own learning;
- better able to meet the needs and learning styles of all students;
- improve communication and support between home and school;
- teaching skills improved;
- more time to share learning strategies; and
- more communication and collaboration resulting in a healthier school climate.

Staff provide assistance to the teacher and student by being present in the regular class and working directly with that particular class.

Support Study Halls

Support study halls have been designed primarily to provide structured organization, support, and accountability for EEN students enrolled in regular classes. Similar services are also provided for non-EEN students in regular education who need additional help. This method is more effective when enrollment is limited. Implementation of a support study hall for these students would:

- help students complete assignments;
- help students experience success and increase self-confidence;
- improve attendance;
- improve self-esteem; reduce frustration;

- improve grades through review; and
- improve study and organizational skills.

Additional ideas for providing extra support for students include:

- Homework Hot Line;
- promote study skills within the subject area;
- sharing test-taking tips with students;
- after-school tutoring;
- assignment monitoring sheet;
- peer tutoring;
- volunteer tutoring;
- organizational/assignment notebook.

Direct and Indirect Support

Direct Support

Staff provide assistance to the teacher and student by being present in the regular class and working directly with that particular class. The following are direct instructional support strategies:

Support staff provides assistance to the teacher and student through open communication and various instructional strategies related to regular classes, frequently performed during support study hall sessions.

1. Provide shoulder to shoulder support in classroom.
2. Use team teaching, and provide feedback to instructor about each lesson.
3. Ask regular ed instructor questions to clarify student confusion of concepts.
4. Monitor student effort and participation.
5. Modify curriculum.
6. Adapt academic materials/assignments.
7. Highlight textbooks.
8. Develop study guides.
9. Take notes.
10. Modify textbook questions.
11. Assist in hands-on activities.
12. Tape-record tests and lessons.
13. Provide extra lab and study time for student.
14. Provide one-to-one tutoring by the Designated Vocational Instructors.
15. Provide small group instructional assistance.
16. Prepare flash cards for test review.
17. Review for tests in study groups.
18. Read tests to students.

Indirect Support

Support staff provides assistance to the teacher and student through open communication and various instructional strategies related to regular classes, frequently performed during support study hall sessions. Strategies include:

1. Define goals on the IEP.
2. Teach parallel instruction; e.g., pre-learning skills, independent living skills, and vocabulary/basic skills needed to succeed in the regular class.
3. Highlight and underline materials and textbooks.
4. Provide computer for assignment completion.
5. Modify curriculum.
6. Adapt academic materials and assignments.
7. Provide resource room support of daily assignments.
8. Provide time to complete tests and assignments given in class.
9. Provide one-to-one tutoring.
10. Provide small group instructional assistance.
11. Prepare flashcards for test review.
12. Review for tests.
13. Read tests to students.
14. Help evaluate EEN students.
15. Assist regular teacher with home-school communication.
16. Advise regular teacher on instructional level and behavioral techniques.

Cooperative Learning Strategies

The interaction among special educators (in their DVI roles), vocational educators, and academic educators includes the introduction of more diverse learning approaches, as well as an array of student performance evaluation approaches that is broader than simple letter grades. The following paragraphs sketch some cooperative learning strategies, followed by a selection of student performance assessment approaches that could be incorporated into a variety of class settings.

The interaction among special educators (in their DVI roles), vocational educators, and academic educators includes the introduction of more diverse learning approaches, as well as an array of student performance evaluation approaches that is broader than simple letter grades.

- **Turn To Your Neighbor.** Three to five minutes. Ask the students to turn to a neighbor and ask him/her to explain a concept you've just taught, or summarize the three most important points of the discussion.
- **Reading Groups.** Students read material together and answer the questions. One person is the reader, another the recorder, and the third the checker. The checker makes sure certain everyone understands and agrees with the answers. They must come up with three possible answers to each question and circle their favorite. When finished, they sign the paper to certify that they all understand and agree on the answers.
- **Jigsaw.** Each person reads and studies part of a selection, then teachers what he/she has learned to the other members of the group. Each then quizzes the group members until satisfied that everyone knows his/her part thoroughly.
- **Focus Trios.** Before a film, lecture, or reading, have students summarize together what they already know about the subject and come up with questions they have about it. Afterwards, the trios answer questions, discuss new information, and formulate new questions.

- **Drill Partners.** Students drill each other on the facts they need to know until they are certain both partners know and can remember them all. This works for spelling, vocabulary, math, grammar, test review, etc. Give bonus points on the test if all members score above a certain percentage.

  Reading Buddies. Have students tell about their books and read their favorite parts to each other.
- **Worksheet Checkmates.** Have two students, each with different jobs, do one worksheet. The reader reads, then suggests an answer; the Writer either agrees or comes up with another answer. When they both understand and agree on an answer, the writer can write it.
- **Homework Checkers.** Have students compare homework answers, discuss any they have not answered similarly, then correct their papers and add the reason they changed an answer. They make certain everyone's answer agrees then staple the papers together. Instructor grades one paper from each group and give group members that grade.
- **Test Reviewers.** Have students prepare each other for a test. They get bonus points if every group member scores above a preset level.
- **Composition Pairs.** Student A explains what he/she plans to write to Student B, while Student B takes notes or makes an outline. Together they plan the opening or thesis statement. Then Student B explains while student A writes. They exchange outlines and use them in writing their papers.

The cooperative learning strategy known as "Reading Buddies" allows students to tell each other about their books and read favorite parts to each other.

- **Board Workers.** Students go together to the chalkboard. One can be the answer suggester, one the checker to see if everyone agrees, and one the writer.
- **Problem Solvers.** Give groups a problem to solve. Each student must contribute to part of the solution. Groups decide who does what, but they must show where all members contributed. Or, they can decide together, but each must be able to explain how to solve the problem.
- **Computer Groups.** Students work together on the computer. They must agree on the input before it is typed in. One person is the Keyboard Operator, another the Monitor Reader, a third the Verifier (who collects opinions on the input from the other two and makes the final decision). Roles are rotated daily so everyone gets experience at all three jobs.
- **Book Report Pairs.** Students interview each other on the books they read, then report on their partner's book.
- **Writing Response Groups.** Students read and respond to each other's paper three times.
  - They mark what they like with a star and put a question mark anywhere there is something they don't understand or think is weak. Then they discuss the paper as a whole with the writer.
  - They mark problems with grammar, usage, punctuation, spelling, or format and discuss it with the author.
  - They proofread the final draft and point out errors for the author to correct. Teachers can assign questions for students to answer about their group members' papers to help them focus on certain problems or skills.

- **Skill Teachers/Concept Clarifiers.** Students work with each other on skills (like identifying adjectives in sentences or showing proof in algebra) and/or concepts (like "ecology" or "economics") until both can do or explain it easily.
- **Group Reports.** Students research a topic together. Each one is responsible for checking at least one different source and writing at least three note cards of information. They write the report together: each person is responsible for seeing that his/her information is included. For oral reports, each must take a part and help each other research until they are at ease.
- **Summary Pairs.** Have students alternate reading and orally summarizing paragraphs. One reads and summarizes while the other checks the paragraph for accuracy and adds anything left out. They alternate roles with each paragraph.
- **Elaborating and Relating Pairs.** Have students elaborate on what they are reading and learning by relating it to what they already know about the subject. This can done before and after reading a selection, listening to a lecture, or seeing a film.
- **Playwrights.** Students write a play together, perhaps about a time period recently studied, and practice and perform it for the class.

Alternative Approaches to Evaluate Student Performance

Traditionally, evaluation has been accomplished by using a report card that contains a stratified reporting scheme designed to distinguish an individual's progress within a range from "outstanding" to "failure." The traditional "A-B-C-D-F" format has been dominant at most grade levels for many decades. Yet, when one considers the broad range of developmental differences of middle level students in the affective and psychomotor domains, as well as in the cognitive domain, five levels of stratification such as "A-B-C-D-F" seem hardly adequate. When one considers "real-life" evaluative situations, stratified progress reporting appears to be more unrealistic.

As part of their approach to make the Water Quality Analysis Project more meaningful to participants, VALP team members used a number of the student performance evaluation approaches described below, including portfolios, projects, and shared grades. Methods from which they chose include the following:

The traditional "A-B-C-D-F" format has been dominant at most grade levels for many decades. Yet, when one considers the broad range of developmental differences of middle level students in the affective and psychomotor domains, as well as in the cognitive domain, five levels of stratification such as "A-B-C-D-F" seem hardly adequate.

- **Portfolios.** As the name suggests, a portfolio is a collection or representative sample of student work that has been selected for presentation and/or evaluation. Much like the artist's portfolio, the student's collection of work displays his or her growth and development in one or more academic areas measured over a period of time. Portfolios are designed to make a statement by the student that "this is who I am, and this is what I do best." A portfolio is an ongoing, ever-growing display of individual developmental changes taking place in the student. It readily serves as a reflective and comparative demonstration of the quality and quantity of a student's achievements.
- **Projects.** Similar in nature to portfolios, projects are intended to be the representative outcomes of predetermined independent activities en-

gaged in by the student. Projects can be designed to meet specific learning outcomes and to address specific levels of cognitive development. While often independent in nature, projects are created and agreed upon in collaboration with the teacher and are evaluated against a predefined set of criteria.

- **Contracts.** Much like the "real-world" situation of an employer entering into a contract with an employee, students agree with the teacher to perform certain learning tasks in a set amount of time. The standard of excellence defined in the contract is used as the basis for determining a student's grade.
- **Conferencing.** Parents meet with teachers, administrators, and often students themselves, to discuss individual growth in all domains. Conferences afford participants the opportunity to ask questions, to give explanations, and to offer constructive advice about the student.
- **Written Narrative.** Through its use student progress is detailed in plain language. Student achievement, plus suggestions for continued growth, are clearly spelled out and preserved in a permanent form. While this process takes a bit longer than most other methods of evaluation, it does force the teacher to be introspective in his or her evaluation of the student, while at the same time clearly spelling out the thoughts of the evaluator to the reader. As advances are made in computer technology, especially in the area of voice digitization, the written narrative will become less cumbersome to create.

While individual evaluation is important, it is also important that students be evaluated in terms of how they are viewed by their peers.

- **Peer Groups.** While individual evaluation is important, it is also important that students be evaluated in terms of how they are viewed by their peers. Beyond making social comparisons, peers can rate the degree of an individual's contribution to group activity. While peer group input would not be the final determinant of a student's evaluation, it may well be used as one of the factors in arriving at that evaluation. It is important to recognize how individuals in a group are perceived by all members of the group, not just by the teacher.
- **Percentage Grading.** Students receive grades based on percentages of correct responses on every assignment completed. Report cards consist of the average of these grades in every subject area.
- **Individual Education Plan.** Students receive the IEP forms written by the Resource Room teacher as a report card.
- **Multiple Grading System.** Students receive a report card with three grades for every subject area. Grades represent ability, effort, and achievement.
- **Shared Grading System.** Grades are cooperatively agreed upon by the resource room teacher and classroom teacher. If a difference occurs, the grades are averaged.
- **Point Grading System.** With a modified program (e.g., oral untimed tests and oral reports) students receive a grade consisting of the following point distribution: 40% tests, 20% reports, 10% attendance, and 30% other activities.

- **Criterion Mastery System.** The teacher sets specific goals and the student receives grades from a pretest/post-test procedure.
- **Pass-Fail System.** Students receive a pass or fail as a grade.
- **Goal-Attainment Scaling.** All involved persons devise a set of goals, assign weight to these goals, develop a set of expected outcomes for each goal, and score each outcome. The grades are calculated as a sum of the outcomes across the goal.
- **Regular Classroom Teacher Controlled System.** Regular classroom teacher grades students with disabilities in the same manner as the rest of the class.
- **Daily-Weekly Guide System.** The students are graded on an equal basis for each day or week regardless of the activity or assignment. Class interaction and participation are also graded. Report card grades are the average of daily grades.

Breakfast Club

Over the past eleven years, a Breakfast Club has met regularly to provide teachers with opportunities to examine their professional practices, instructional strategies, and other topics as they pertain to special education students and other low achieving pupils. This informal, voluntary gathering takes place before the start of the school day. Topics vary with the current needs of staff, or the manifest problems of individual students. Participants, who often bring food and beverages to share with the group, find that these face-to-face encounters are preferable to contact primarily by note, memo, or phone call. One member of the VALP team originated this practice, and several VALP team members are regular or occasional participants.

Over the past eleven years, a Breakfast Club has been meeting regularly to provide teachers with opportunities to examine their professional practices, instructional strategies, and other topics as they pertain to special education students and other low achieving pupils.

The Mechanics of Communication and Documentation

In addition to the Multi-disciplinary Team disability determination and documentation of need for special education services and the Individualized Educational Program development process, Spooner High School staff provide each other with essential information about specific students that will enhance their instruction and improve the students' learning. The following four figures illustrate the forms used to communicate this information. These include *Figure 4.4, EEN Mainstream Placement Checklist*; *Figure 4.5, Co-Teaching Planning Sheet*; *Figure 4.6, Weekly Assignment Sheets*; and *Figure 4.7, Cooperative Lesson Worksheet.*

Water Quality Analysis Project: How It Evolved

The integrated approach began in the fall of 1994 with a three-week introductory unit and continued approximately one day per week for the full school year. Small student cooperative learning teams were identified by combining high achieving students with low achievers. The initial teams of four proved to be too large. Not all members contributed. After their initial experience with four-person teams, Mr. Flynn and Ms. Olson-Rosenbush reduced team membership to two, one Chemistry II student and one Natural Resources student per team until all Natural Resources students were paired up. The remaining Chemistry II students paired with each other. Work team membership was rotated frequently by the instructors. The two-member team format worked well, as indicated by student performance (see evaluation section later in the chapter).

A DVI provided instructional support in the integrated classroom whenever both groups were together, as well as three days per week in the Natural Resources class. The DVI also developed modifications and instructional strategies based on an on-going assessment of individual student needs.

One additional modification was developed after the initial water sample collection/analysis activities due to the great skill and knowledge disparity between the Natural Resources students and the Chemistry II students, and the resulting anxiety this produced in the Natural Resources students. That modification consisted of a 30-minute prep session for the Natural Resources students held prior to a scheduled collection/analysis sequence. Mr. Flynn, the chemistry instructor, conducted each prep as part of a Natural Resources class. With this additional orientation, the Natural Resources students participated effectively in the integrated activities.

The VALP Team planned to meet weekly to discuss student progress and determine strategies for improving the implementation of the integrated project. As the effort developed, a time crunch developed (typically, instructors prepared for six classes per day), so weekly meetings did not occur. Informal communication did happen often enough to ensure continuity.

The DVI developed modifications and instructional strategies based on an on-going assessment of individual student needs.

▲ *VALP Team members, top row, from left: Dave Parish, Larry Flynn, Jon Miller, Dick Gerberding, Dan Schullo; bottom row, from left: Kathy Joyce, and Harry Hughes.* ▲

Periodically throughout the year, the cooperative learning groups collected water samples from various field sites in the Spooner area. These included numerous samples from different points on the Yellow River and the

(Text continued on page 158)

Figure 4.4

EEN Mainstream Placement Checklist

School year

Classroom teacher

Student's name

Special education teacher responsible for mainstreaming

Other specialists involved

What makes this student exceptional?

- ___ Speech/language disorder
- ___ Cognitively disabled
- ___ Emotionally disturbed
- ___ Hearing impaired
- ___ Learning disabled
    - Area(s) of disability
- ___ Physical or health impairment
- ___ Visually impaired
- ___ Giftedness or talent
- ___ Other

Why is this student being mainstreamed?

- ___ Social skills
- ___ Academic skills
- ___ Subjects:
- ___ Speech/language skills
- ___ Specific goal(s) for mainstreaming:
- ___ Expectations for student's behavior/academic progress:
- ___ Reading skills
    - ____ At grade level
    - ____ Below grade level
    - ____ Above grade level
    - ____ Math skills
    - ____ At grade level
    - ____ Below grade level
    - ____ Above grade level

How can I best teach/evaluate this student?

Modes of learning best suited for this student

- ___ Visual

Figure 4.4, continued

EEN Mainstream Placement Checklist

___ Auditory
___ Tactile
___ Group
___ Individual
___ Other

The following areas need modifications for this student in the classroom:

___ Student's physical placement in class
___ Teacher's physical placement in class
___ Presentation of visual subject matter
___ Presentation of auditory subject matter
___ Hands on learning/manipulatives
___ Peer interaction/cooperative learning
___ Seat work
___ Special activities
___ Mobility
___ Recitation/discussion
___ Lecture/note taking
___ Curriculum level
___ Tests
___ Homework assignments

Who will grade this student?

___ Regular education teacher
___ Special education teacher
___ Both

Behavior modifications that are necessary, or work well with this student:

___ Reinforcement: (specify: praise, tokens, etc.)
___ Contingency contract
___ Self-regulation
___ Time out
___ Withdrawal of privileges
___ Other

Explanation of relevant terminology:

Date of initial mainstreaming placement meeting:

Figure 4.5
Co-Teaching Planning Sheet

Item/Dates	
Goals and Objectives	
Strategies, Activities, Materials	
Student Expectations	
Evaluation Criteria and Instruments	
Anticipated Problems	
Management	
Additional Support	
Other_______________	

Figure 4.6
Weekly Assignment Sheets

Teacher's name

Class

Students

1. Week of
2. Assignments due
3. Missing assignments
4. Weekly test dates
5. Do any students need special assistance in your class this week?

Names	Describe assistance needed

6. Do you have material or tests that need modification? (attach copy and describe need)
7. Please check if you wish a conference ☐
8. List any comments or concerns on any student (either positive or negative). Areas to consider, but not limit to, would be attendance, behavior, promptness, completion of assignments, test scores, personal hygiene, and attitude.

Figure 4.7

Cooperative Lesson Worksheet

Grade level

Subject area

1. Select a lesson

2. Make decisions
   - Group size
   - Assignment to groups
   - Room arrangement
   - Materials needed for each group
   - Assigning roles

3. Set the lesson. State it in language the students understand.
   - Task
   - Positive interdependence
   - Individual accountability
   - Criteria for success
   - Specific behaviors expected

4. Monitor and process:
   - Evidence of expected behaviors (appropriate actions)
   - Observation form
   - Observer(s)
   - Plans for processing (feedback)

5. Evaluate outcomes
   - Task achievement
   - Group functioning
   - Notes on individuals
   - Suggestions for next time

Spooner wastewater treatment facility. Comparative samples from their own well water supplies were brought in by students. The cooperative lab groups performed various water quality factor tests including dissolved oxygen, fecal coliform, pH, biological oxygen demand, temperature, total phosphates, nitrates, turbidity, and total dissolved solids/conductivity. The students calculated the overall water quality and evaluated the impact of the city of Spooner on the Yellow River and the effectiveness of the wastewater treatment facility. Journals, group portfolios and written reports of the analysis, synthesis, and evaluation of data were integrated with English and computer classes for the ultimate goal of publishing a final document. The history class was integrated in various ways including studying the history of the Spooner area and the impact of water cleanliness on the area's economy and tourism industry. Mathematics and computers were integrated by helping to create charts, graphs, maps, and tables from collected data of all water sites.

The integrated approach began in the fall of 1994 with a three-week introductory unit and continued approximately one day per week for the full school year.

Community Involvement

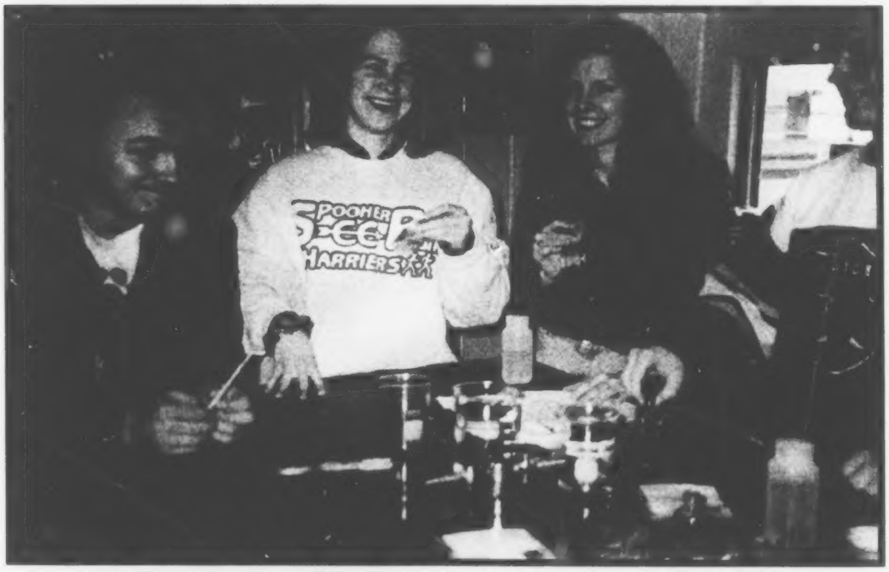
The local Spooner office of the Department of Natural Resources (DNR) is very supportive of this project and provided speakers for oral presentations and written materials to the class and provided staff expertise for water collection field trips. To enhance student communication skills and citizenship, students delivered oral presentations to various community groups.

Water Quality Analysis: Individual Lessons

On the following pages, *Figure 4.8* outlines the individual lessons used in the Natural Resources Class for the integrated water quality analysis portion of the course. *Figure 4.9* illustrates many of the lesson plans and work sheets used in the Chemistry II class for the integrated water quality analysis portion of the course. In both classes, portions of the textbooks referenced were also used as part of the water quality analysis effort.

(Text continued on page 176)

Periodically throughout the year, the cooperative learning groups collected water samples from various sites in the area.



▲ ***Students (from left) Travis Moore, Leeanne Berger, Kelly Conroy, and Brandon Pinkerton analyzing their water samples.*** ▲

Figure 4.8

Individual Lesson Outline for Natural Resource Management: Basic Introduction for Water Quality Integration Project

Text: William G. Camp & Thomas B. Daugherty, Managing Our Natural Resources, *Delmar Publishers, Inc.*

Instructor: Susie Olson-Rosenbush

Day 1 Seating arrangements, classroom rules, introductions. Videotape: *Spaceship Earth*, 25 minutes.

Day 2 Read Chapter 1: *Our Natural Resources … Then and Now*. Review objectives:

- Define and discuss the concept of natural resources.
- List and describe the major categories of natural resources in America.
- Explain what makes something a natural resource. Distribute assignment.

Day 3 Allow time to work on Chapter 1 assignment. Discuss objectives. Orally inventory the natural resources in our community.

Day 4 Read Chapter 2: *A History of Conservation in the U.S.* Review objectives:

- Contrast exploitation, conservation, and preservation as they relate to natural resource management.
- Outline the history of conservation in the U.S.
- Describe the role of the federal government in conservation. Distribute assignment.

Day 5 Allow time to work on Chapter 2 assignment. Discuss objectives. Read Chapter 3: *Concepts in Natural Resources Management*. Review objectives:

- Explain the differences between inexhaustible, renewable, and exhaustible natural resources.
- Discuss the concept of balance in natural ecosystems.
- Discuss the role of ecology in human efforts at natural resources management.

Day 6 Distribute Chapter 3 assignment and allow work time. Discuss objectives.

Day 7 Project WILD Activity; *Carrying Capacity*. Allow time to review for quiz on Chapter 1, 2, and 3.

Day 8 Quiz on Chapters 1, 2, and 3. Correct and take grades.

Day 9 Read *Water Supply and Water Users.*
Review objectives:

- Explain the components of the hydrologic cycle.
- Explain the main water users.
- Identify and discuss the common types of irrigation systems.

Day 10 Groundwater Study Guide, WI Department of Natural Resources, 1990, activity sheet: *Round and Round It Goes*. Allow student work time. Discuss results.

Figure 4.8, continued

Individual Lesson Outline for Natural Resource Management: Basic Introduction for Water Quality Integration Project

Day 11	Begin large group activity on testing well water; Natural Resources students bring in water samples. ■ Group 1 set up for coliform test; test for nitrates and lead. ■ Group 2 videotape *Natural Geographic Water Issues* article.
Day 12	Group 1 videotape. Group 2 set up for coliform test, test for lead and nitrates.
Day 13	Groups 1 and 2 coliform test, interpret results. Assign activity: Keep an account of all the water you use in three days. Bring that account to class on Day 17.
Day 14	Continue discussing the value of water to our everyday lives. Videotape, *Keeping Groundwater Clean*, John Deere.
Day 15	Guest speaker: Groundwater law.
Day 16	Read Chapter 11: *Water Pollution.* Review objectives ■ Identify the three major water pollution groups. ■ Explain the four major categories of industrial pollution. ■ Explain the function of a cooling tower and cooling lagoon. ■ List and explain the major agricultural pollutants. ■ Explain the common water pollution control. Distribute assignment.
Day 17	Begin large group activity on dissolved oxygen. Group 1 actual testing. Group 2 discussing results of water use activity.
Day 18	Group 1 discuss results of water use activity. Group 1 actual testing.
Day 19	Large group interpretation and discussion.
Day 20	Allow time to work on Chapter 11 assignment.
Day 21	Biological oxygen demand test, all students.
Day 22	Discussion in separate rooms. Introduction to integrated project.
Day 23	Begin large group, long term project: Water Quality Testing Demonstration Day, in which all students observe proper sampling techniques that will be conducted near the fish hatchery.
Day 24	Testing water for turbidity, coliform, phosphates, pH, dissolved oxygen, biological oxygen demand, nitrates, temperature, alkalinity, hardness, conductivity. Collection of water
Day 25	Run tests.
Day 26	Individual classrooms.
Day 27	Individual classrooms.
Day 28	Large group tabulation and conclusion.

Figure 4.9

Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Source Text: Cliff Jacobson, Water, Water Everywhere: Teacher Guide and Experiments *(Second Edition), Hach Company, Loveland CO, 1991.*

Instructor: Larry Flynn

Lesson Plan I

Integrated activity

Testing well water.

Length of activity

Two class periods.

Objectives

Upon completion of this activity, students will be able to:

1. Determine the presence of lead, nitrate, and fecal coliform in water samples obtained from home wells.
2. Demonstrate cooperation and laboratory skills.
3. Evaluate the quality of well water based on laboratory results.
4. Recognize the importance of quality drinking water.

Teacher input

1. Prepare Chem. II students for leadership roles and testing procedures.
2. Discuss the role of ground water in the water cycle with Natural Resources students.
3. Discuss effects of water contaminants in well water.

Guided and independent practice

1. Students in cooperative lab groups will perform lead, nitrate, and fecal coliform tests.
2. Students in cooperative groups will evaluate their results.

Closure

1. Teacher-led discussion of individual and group results.
2. Final lab report becomes part of group portfolio.

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Testing Well Water Work Sheet
Group members

Purpose

Data table

Names of group members	Coliform (MPN/100ml)	Lead (mL or ppb)	Nitrate (mg./L or ppm)
____________________	________	____	______
____________________	________	____	______
____________________	________	____	______

Using the reference materials provided, answer the following questions regarding coliform.

1. What is the source of coliform bacteria?
2. What are acceptable coliform standards for the following:
   - drinking water?
   - swimming pools?
   - swimming beaches?
   - general recreational waters (not for swimming)?
3. Analyze the class data, and determine how safe the wells are in providing drinking water.

Using the reference materials provided, answer the following questions regarding nitrates.

4. What are the sources of nitrates?
5. What are the health-related concerns?
6. What are the acceptable limits for drinking water?
7. Analyze the class data and determine how safe the wells are in providing drinking water.

Using the reference materials provided, answer the following questions regarding lead.

8. What are the sources of lead?
9. What are the health related concerns?
10. What are the acceptable limits for drinking water?
11. Analyze the class data and determine how safe the wells are in providing drinking water.
12. You are a technician at a state laboratory. You analyzed the following samples and determined the levels indicated.

Water Sample	Coliform	Lead	Nitrates
Well sample, John/Mary	3.6	.01	5.7
Well sample, Bob/Betty (expecting a child)	0.0	.08	13.1
Well sample, Harry/Hildegard	.25	.02	8.2
Shell Lake Public Beach	280	1.05	72

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Compose a letter to each of the individuals involved. In your letter:

- Communicate to them factors that are within acceptable limits.
- Communicate to them factors that are not within acceptable limits.
- Indicate to them the possible sources of the contamination and the health related concerns that may arise as a result of the contamination.

* * *

Lesson Plan II

Integrated activity

National Geographic water issues: Analysis.

Length of activity

One class period.

Objective

Upon completion of this activity, students will be able to:

1. Analyze a specific issue concerning water use or water quality.
2. Demonstrate the skills necessary to identify a local quality issue, perform an issue analysis, and develop and implement a criteria action plan.

Teacher input

Chemistry II students will be prepared for leadership role and methods of environmental issue analysis.

Guided practice

1. Students in cooperative learning groups will view National Geographic video on water.
2. Students in cooperative learning groups will perform an issue analysis regarding:
    - identification of the issue itself;
    - the players involved;
    - the players' positions;
    - brainstorming of possible solutions.

Independent practice

Students will perform an issue analysis on an environmental issue article from a reputable magazine or newspaper.

Closure

1. Classroom discussion of individual and group results.
2. Individual and group analysis become part of group portfolio.

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Water Issue Analysis Work Sheet
Group members

Purpose

1. Identification of the issue:
2. The players involved:
3. The players' position:
4. The players' beliefs:
5. The players' values:
6. Brainstorm possible solutions to this problem.
7. Select one of your possible solutions and identify its advantages and disadvantages.

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Lesson Plan III

Integrated activity
Determining dissolved oxygen (D.O.) content.

Length of activity
Two class periods.

Objectives
Upon completion of this activity students will be able to:

1. Acquire the skills necessary for performing the dissolved oxygen test.
2. Determine the relationship between temperature and aeration on dissolved oxygen levels in water samples.
3. Understand the relationship between D.O., water quality and the aquatic ecosystems.

Teacher input
Chemistry II students will be prepared for leadership role and methods of D.O. testing.

Guided and independent practice

1. Students in cooperative lab groups will perform D.O. test on a variety of water samples.
2. Students in cooperative lab groups will evaluate the relationship between D.O., temperature, and aeration.

Closure

1. Teacher-led discussion of group results.
2. Final lab report becomes part of group portfolio.

Figure 4.9, continued

Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Lesson Plan IV

Integrated activity

Individual water use analysis.

Length of activity

Three days of individual data collection; one and one-half class periods.

Objectives

Upon completion of this activity, student will be able to:

1. Increase awareness of extent and impact of their everyday direct water usage.
2. Evaluate their own water usage as compared to the remainder of the group and to national averages.

Teacher input

Teacher will discuss guidelines for water use analysis activity.

Guided practice

1. Students in cooperative groups will brainstorm methods of collecting accurate data on family water usage.
2. Students in cooperative groups will discuss and evaluate their water usage.
3. Students in cooperative groups will participate in a simulation allowing them to prioritize water usage.

Independent practice

Student collection of water usage data for three days.

Closure

1. Student led discussion of water usage and simulation results
2. Final results to be placed in group portfolio.

Water Use Analysis Work Sheet

Group members

Purpose

Information gathering

Keep a diary of water use in your home for three days. Using chart like the one following, record the number of times various water-use activities occur. Ask each family member to help. Check the activities listed on the chart. If family members use water in other ways during the three days, add these to your diary. Estimate the amounts of water used by those activities. The data you gather will help you see how much water you and your family use

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

each day, and for what purposes. You may be surprised at how much you use, which will lead you to think about the next important question: Why is water such an important substance?

Water Use Recording Form

Activity	Day 1	Day 2	Day 3
■ Number of persons in family present	_____	_____	_____
■ Number of baths	_____	_____	_____
■ Number of showers	_____	_____	_____
■ Length of each in minutes	_____	_____	_____
■ Number of washing machine loads			
• low setting	_____	_____	_____
• high setting	_____	_____	_____
■ Dishwashing			
• number of times by hand	_____	_____	_____
• number using dishwasher	_____	_____	_____
■ Number of toilet flushes	_____	_____	_____
■ Watering lawn	_____	_____	_____
• time in hours	_____	_____	_____
■ Number of car washes	_____	_____	_____
■ Cooking and drinking			
• number of cups	_____	_____	_____
■ Running water in sink	_____	_____	_____
• number of minutes	_____	_____	_____
■ Other uses and number of each	_____	_____	_____

Water Use Analysis Work Sheet

Group members

Purpose

The accompanying list shows typical quantities of water used in the home. Use this list to answer the following questions.

Water required for typical activities:

■ Bathing (per bath)	130 L
■ Showering (per minute)	
• regular showerhead	19 L
• water-efficient showerhead	9 L

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

▪ Cooking and drinking	
• per 10 cups of water	2 L
▪ Flushing toilet (per flush)	
• conventional toilet	19 L
• "water saver" toilet	13 L
• "Low-flow" toilet	6 L
▪ Watering lawn (per hour)	1130 L
▪ Washing clothes (per load)	
• low setting	72 L
• high setting	170 L
▪ Washing dishes (per load)	
• by hand, with water running	114 L
• by hand, washing/rinsing in dishpans	19 L
• by machine, full cycle	61 L
• by machine, short cycle	26 L
▪ Washing car (running hose)	680 L
▪ Running water in sink (per min.)	???

1. Estimate the total water volume (in liters) used by your household during the three days.
2. What was the average amount of water in liters used by EACH family member over the three days? To find the average, divide the total volume of water used in three days by the number of family members. This answer will be in units of liters per person per three days.
3. On average, how much water in liters did EACH family member use in one day?
4. Compare the average water volume used daily by each person in your household (answer 3) with the reported average water volume used daily by each person in the United States, 340 L. What reasons can you give to explain any differences between your average and the national average?
5. If water cost as much as gasoline, how much would you spend on water in a day? (Hint: .96 L = one quart).
6. If water cost as much as milk, how much would you spend on water in a day? (Hint: .96 L = one quart).

Authorities have severely rationed your home water supply for three days while possible causes of the eagle kill are investigated. The County Sanitation Commission recommends cleaning your bathtub and filling it with water. That water must be used for everything except

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

drinking and cooking during the three day period. (Water for drinking and cooking will be trucked in from Shell Lake.)

Assuming that your family has one tub of water, 375 L (100 gal.) to use during these three days, consider this list of typical water uses:

- washing car, floors, windows, pets;
- bathing, showering, washing hair, washing hands;
- washing clothes, dishes;
- cooking and preparing food;
- drinking
- watering indoor plants, outdoor plants, lawn;
- flushing toilet

1. Which water uses could you completely avoid?
2. What would be the consequences?
3. For which tasks could you reduce your water use?
4. How?

Impurities added by some water uses may not interfere with reusing the same water for other purposes. For example, you might decide to save hand-washing water, using it later to wash the pet dog.

5. For which activities could you use such impure water ("gray water")?
6. From which prior uses could this water be taken?

Clearly, pure water is a valuable resource no one should take for granted. Unfortunately, water is easily contaminated.

□□□

Lesson Plan V

Integrated activity
Biological Oxygen Demand Test (B.O.D.)

Length of activity
One and one-half class periods.

Objectives
Upon completion of this activity students will be able to:

1. Understand the relationship between biological oxygen demand (B.O.D.) and water quality.
2. Recognize the effect of contaminants on dissolved oxygen (D.O.) levels.

Figure 4.9, continued

Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Teacher input

Overview of purpose of B.O.D. test.

Guided and independent practice

1. Students in cooperative lab groups will perform B.O.D. test on solutions having various levels of contamination.
2. Students in cooperative groups will discuss and evaluate their findings.

Closure

1. Students report group results to class.
2. Final group results to be placed in group portfolio.

Biological Oxygen Demand Work Sheet

Group members

Purpose

Data table

Record the exact time of mixing (on the minute) in the table below next to test tube one.

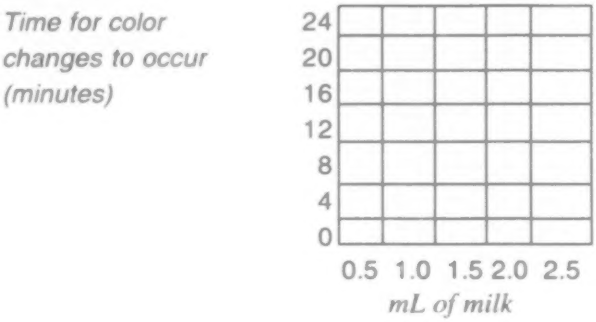
Test tube	Time of mixing (on the minute)	Time when tube changes color (A)	Total time for changes to occur (B)
1.			
2.			
3.			

Conclusions

1. Name the gas "inhaled" (taken in) by microorganisms.
2. Name the gas "exhaled" by microorganisms.
3. Where do microorganisms living in water get the oxygen they feed to live?
4. Where do green plants living in water get carbon dioxide they need to live?
5. Shake one of the test tubes that turned white. What happens to the color? Why does the color change?
6. Air is added naturally to rivers when water goes through rapids and over falls. How does shaking the test tube prove that air is added to water when it tumbles over rocks?
7. Why is the oxygen in this experiments "used up"?
8. Name the part of the experiment that represents microorganisms.
9. Name the part of the experiment that represents waste.
10. In which test tube did you have the most waste? The least waste?

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

11. Graph your results here.



12. What does the line you plotted tell you about the relationship between the amount of waste and oxygen in a body of water?
13. If large amounts of waste were dumped in a river, what would be the effects of the dissolved oxygen in the water?
14. Some bacteria, given ample food and water, can multiply every 20 minutes. Compute the number of bacteria present after eight hours at this rate (starting with one bacterium cell). Example: in 20 minutes there would be two bacteria, in 40 minutes, four; in 60 minutes, eight bacteria, etc.
15. A company proposed the buy-out of several abandoned farms along the Yellow River. Their intent is to create a huge beef feedlot operation. What are potential implications of this type of operation on the river's ecology? As a concerned citizen, what questions would you like to have answered prior to the operation starting up?

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Lesson plan VI

Integrated activity

Demonstration of yearlong water quality testing.

Length of activity

Two class periods (consecutive).

Objectives

Upon completion of this activity students will be able to:

1. Demonstrate skills necessary to collect and treat samples for measurement of various water quality factors.
2. Demonstrate skills necessary to perform water quality factor tests.
3. Demonstrate cooperative and laboratory skills.

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Teacher input

1. Prepare Chem. II students for leadership roles, and collection and testing procedures.
2. Discuss the importance of water quality and water quality monitoring with N.R. students.
3. Have DNR Water Quality Specialist available for student questioning.
4. Correct water collection techniques will be modeled.

Guided and independent practice

1. Students in cooperative lab groups will collect and treat samples for water quality tests at a Yellow River site.
2. Students in cooperative lab groups will conduct water quality tests for dissolved oxygen, fecal coliform, pH, biological oxygen demand, temperature, total phosphates, nitrates, turbidity, and total dissolved solids/conductivity.

Closure

1. Student evaluation to be kept in group portfolio.
2. Teacher-led discussion.

□□□

Bimonthly Lesson Plan

Integrated activity
Water quality testing.

Length of activity
Four class periods.

Objectives
Upon completion of this activity students will be able to:

1. Demonstrate skills necessary to collect and test samples for measurement of various water quality factors.
2. Demonstrate skills necessary to perform water quality factor tests.
3. Evaluate the overall water quality of water in the Yellow River and from various states in waste treatment.
4. Demonstrate cooperative and laboratory skills.
5. Develop and/or enhance knowledge, values, attitudes, skills and citizen action skills as they relate to water, water quality and the resolution of water issues.

Teacher input

1. An overview of test sites, group assignments and expectations.

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

2. Chemistry II students will be prepared for the procedure to be used in determining overall water quality.

Guided and independent practice

Students in cooperative lab groups will collect water samples at Yellow River sites and waste treatment sites.

2. Students in cooperative lab groups will perform water quality factor tests for dissolved oxygen, fecal coliform, pH, biological oxygen demand, temperature, total phosphates, nitrates, turbidity, and total dissolved solids/conductivity.
3. Students in cooperative groups will calculate the overall water quality using teacher provided water quality index factor.
4. Students in cooperative groups will evaluate the impact of the city of Spooner on the Yellow River and the effectiveness of the waste water treatment facility.

Closure

1. Teacher-led discussion of group results.
2. Student evaluation of initial water quality testing activity.
3. Group analysis becomes part of the group portfolio.

This lesson plan will be used bimonthly as the water quality activity continues. The intent is to eventually utilize the Internet to compare and contrast the data with data from other areas.

Total Phosphorous (mg/l P) Work Sheet*
Group Members

Date/Time

- Sample/Site #
- Results (mg/l)
- High standard (4.0 mg/l +/- -0.4)
- Low standard (0.07 mg/l +/- .007)
- Field blank
- Spike sample
- Duplicate
- Sample bottle: acid-washed 250 ml polyethylene bottle
- Preservation: none if stored in the dark at 4 degrees Celsius, analyze at room temperature.
- Holding time: analyze within 24 hours.

* mg/l P = mg/l PO4 divided by 3

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

Turbidity for Hach 2100P Work Sheet
Group Members

Date/Time
Use signal average for reading.

Sample/Site #

Results (NTU)

- Cal. standard (0 - 10)
- Cal. standard (0 - 100)
- Cal. standard (0 - 100)

Field blank
Duplicate
Sample bottle: 250 ml polyethylene bottle.
Preservation: cool to 4 degrees Celsius; analyze at room temperature.
Holding time: analyze within 48 hours.

Lab pH Work Sheet
Group Members

Date/Time:
Sample/Site #

Results (NTU) Lab Temperature

- 4.01 buffer (+/- 0.02)
- 7.00 buffer (+/- 0.02)
- 10.00 buffer (+/- 0.03)

Duplicate
Field blank
Calibration buffer pH
Sample bottle: 250 ml polyethylene bottle.
Preservation: cool to 4 degrees Celsius; analyze at room temperature.
Holding time: analyze immediately upon return to laboratory.

Water Quality Testing Questions — Yellow River Sites
Group Members

Purpose

1. Compare the overall water quality index of the Yellow River before and after it passes through the city of Spooner.

Figure 4.9, continued
Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

2. What specific water quality factors contribute to differences in overall water quality noted?
3. What are the possible sources of contamination?
4. How does the quality of the culvert effluent compare to the overall water quality of the riverway?
5. What degree of impact does the city of Spooner have on the Yellow River?

Water Quality Testing Questions— Waste Treatment Plant

1. Compare the overall water quality as it passes through the various stages of the waste treatment process.
2. What specific water quality factors showed significant improvements?
3. If the city of Spooner discharged directly into the Yellow River, what effects of the river's ecology would be expected?
4. If #3 occurred, what specific changes or improvements would have to be made? Why?
5. Shake one of the test tubes that turned white. What happens to the color? Why does the color change?
6. Air is added naturally to rivers when water goes through rapids and over falls. How does shaking the test prove that air is added to water when it tumbles over rocks?
7. Why is the oxygen in this experiment "used up"?
8. Name the part of the experiment that represents microorganisms.
9. In which test tubes did you have the most waste? The least waste?
10. Graph your results here. [Graph omitted.]
11. What does the line you plotted tell you about the relationship between the amount of waste and oxygen in a body of water?
12. If large amounts of waste were dumped in a river, what would be the effects of the dissolved oxygen in the water?
13. Some bacteria, given ample food and water, can multiply every 20 minutes. Compute the number of bacteria present after eight hours at this rate (starting with one bacterium cell). For example, in 20 minutes there would be two bacteria; in 40 minutes, four bacteria; in 60 minutes, eight bacteria; etc.
14. A company proposed the buy-out of several abandoned farms along the Yellow River. Their intent is to create a huge beef feed lot operation. What are potential implications of this type of operation on the river's ecology? As a concerned citizen, what questions would you like to have answered prior to the operation starting up?

❑❑❑

Figure 4.9, continued

Individual Lesson Outline for Chemistry II Curriculum Integrated with Natural Resources

5 Day Biological Oxygen Demand (mg./l)Work Sheet

Group Members

Date/Time

- Incubation: 5 days +/- 3 hours
- Time in:
- Incubation temp.
- Time out:
- Incubation temp.
- Site #
- Bottle #
- Initial DO
- Final DO
- BOD mg/l
- Dil. blank

Duplicate

Sample bottle: 3-300 BOD bottle

Preservation: cool to 4 degrees Celsius; store in the dark; analyze at room temperature.

Holding time: analyze within 48 hours.

Dissolved Oxygen and % Saturation Work Sheet

Group members

Date / time

- Titration cartridge (N)
- Sample volume
- Digit multiplier
- Site #
- Bottle #
- Digits
- DO (mg/l)
- % sat.

Duplicate

Digit multiplier x digits used = DO (mg/l)

Sample bottle: 300 ml glass BOD bottle.

Preservation: Fix on sample site; store in the dark.

Holding time: analyze within 8 hours.

Results

Program Evaluation

As one of the requirements for receiving the subcontract from the Center on Education and Work, the Spooner VALP team developed the program evaluation plan shown in *Figure 4.10*. As part of that evaluation plan, the VALP team also designed a pretest for use with students participating in the water quality analysis. Due to design problems in the original version of the pretest, the data were not able to be analyzed meaningfully. A corrected version, *Figure 4.11*, is included for the reader's consideration.

In addition, the VALP team designed an Instructor Evaluation of the Cooperative Learning Strategy (*Figure 4.12*), a Student Evaluation of the Cooperative Learning Strategy (*Figure 4.13*), a Teacher Attitude Survey (*Figure 4.14*), and a Student Interest Survey (*Figure 4.15*). Problems encountered in the administration of the Student Evaluation of the Cooperative Learning Strategy, the Teacher Attitude Survey and Student Interest Survey also precluded use of results. Copies of the survey instruments are included for the reader's consideration.

The three instructors who implemented this effort on a day-to-day basis, the Chemistry teacher, the Natural Resources teacher, and the DVI (known locally as the DI), provided narrative descriptions of their experience in lieu of completed Instructor Evaluation of the Cooperative Learning Strategy forms. As these narratives (following) indicate, the project was a success.

The three instructors who implemented this effort on a day-to-day basis, the Chemistry teacher, the Natural Resources teacher, and the DVI (known locally as the DI), provided narrative descriptions of their experience. As these narratives (following) indicate, the project was a success.

These views are supported by the fact that the cooperative water quality analysis approach was continued and expanded for the 1995-96 school year, and the fact that non-school personnel, specifically a parent of one of the participating students and the city of Spooner's Superintendent of Utilities were also quite supportive of this effort. Lastly, the participating students' grades and attendance patterns strongly support the value of this integrated effort (*Figure 4.16* and *Figure 4.17*).

(Text continued on page 186)

▲ *Student Jeremiah Trepczyk collecting water sample from the Yellow River.* ▲

Figure 4.10
Program Evaluation Plan

Evaluation Questions (Claims or Outcomes)	*Data/Information to Be Collected (Claim Categories or Indicators)*	*Data Sources*	*Instruments, Methods, Procedures (Comparison Standards)*
Has there been a change in knowledge or skills?	Academic achievement	Student responses	Pre- and Posttest (teacher designed)
Has there been a change in student attitudes and behaviors?	Student attitudes	Student responses and teacher observations	Information journal (data, graphs, summary, and evaluation) Portfolio development Student survey and/or interview
Has there been a change in teacher attitudes and behaviors?	Teacher attitudes	Teacher response	Teacher survey and summary Job satisfaction survey
Has there been an improvement in instructional practices and procedures?	Instructional practices	Attendance records, grades, and direct observations	Cooperative learning, peer mentoring, and field experiences
Has VALP Team met its goals and objectives?	Process goals and objectives	VALP Team	Checklist of project timeline and evaluation components.

Figure 4.11
Pre-Test Questionnaire
Water Quality Integration Project

A. A number of paired adjectives and short sentences are listed below. Please mark the level of each with an "X" according to your feelings and opinion about the Yellow River.

The Yellow River

I strongly agree with the left description								I strongly agree with the right description
I know it vaguely.	1	2	3	4	5	6	7	I know it well.
I am unfamiliar with the river.	1	2	3	4	5	6	7	I am familiar with the river.
It is dirty.	1	2	3	4	5	6	7	It is clean.
It is turbid.	1	2	3	4	5	6	7	It is transparent.
It is beautiful.	1	2	3	4	5	6	7	It is ugly.
I dislike it.	1	2	3	4	5	6	7	I like it.
I feel sad about it.	1	2	3	4	5	6	7	I feel happy about it.
I am worried about it.	1	2	3	4	5	6	7	I am content with it.
It is necessary.	1	2	3	4	5	6	7	It is unnecessary.
It is urgent.	1	2	3	4	5	6	7	It is not urgent.
It is difficult.	1	2	3	4	5	6	7	It is easy.
Simple task.	1	2	3	4	5	6	7	Complex task.
It is government's responsibility.	1	2	3	4	5	6	7	It is citizen's responsibility.
I feel helpless.	1	2	3	4	5	6	7	I feel empowered.
I don't know what I can do.	1	2	3	4	5	6	7	I have ideas about what I can do.
I can help.	1	2	3	4	5	6	7	I cannot help.
My life will change for it.	1	2	3	4	5	6	7	My life will not change for it.

B. 1. The following activities may affect the *water quality of rivers* in different ways: by improving or degrading or not affecting the water quality. Please circle the effect of each activity in column A.

"+" = improves water quality or reduces degradation of water quality
"–" = degrades or worsens water quality
"0" = does not affect water quality

Figure 4.11, continued

Pre-Test Questionnaire

B. 2. At the same time, *how confident* do you feel about *your knowledge* when you answer each question? Please indicate the extent to which you are confident in answering each question in column B.

	Activities	**Column A**			**Column B**			
		Impact on water quality			Degree of confidence			
		good	none	bad	very unsure	unsure	sure	very sure
1.	Overuse of fertilizer in the farmers' field	+	0	–	1	2	3	4
2.	Using soap instead of detergent for laundry	+	0	–	1	2	3	4
3.	Changing lawns into cement along the river	+	0	–	1	2	3	4
4.	Discharge from septic tank	+	0	–	1	2	3	4
5.	Changing woodlands into golf courses	+	0	–	1	2	3	4
6.	Digging up sand along the river bank	+	0	–	1	2	3	4
7.	Fishing from the river bank	+	0	–	1	2	3	4
8.	Acid rain	+	0	–	1	2	3	4
9.	Garbage on the streets	+	0	–	1	2	3	4
10.	Hot water discharged from factories	+	0	–	1	2	3	4
11.	Building roads over the river	+	0	–	1	2	3	4
12.	Dredging the mud from river bottom	+	0	–	1	2	3	4

C. The following are paired statements about who has responsibility for school environmental protection, the school administration or students. After you considered the ideal and actual situation (personal factors, academic work load, school administration, and society), who do you think should take charge of the school environmental protection? Please indicate your opinion about each pair of statements by circling a number.

0 = neutral *1 = strongly agree* *2 = agree* *3 = agree* *4 = strongly agree*

1.	Students should wait for directions from administration, then take action.	0 1 2 3 4	Students should initiate school environmental protection (e.g., providing ideas on recycling).
2.	The direction of school environmental protection should be decided by the students (i.e. whether the school should recycle).	0 1 2 3 4	The direction of school environmental protection should be decided by the administration.
3.	School environmental protection tasks should be planned by students.	0 1 2 3 4	School environmental protection tasks should be planned by the administration (e.g., how to recycle).

Figure 4.11, continued

Pre-Test Questionnaire

4. School environmental protection should funded by the students.	0 1 2 3 4	School environmental protection should be be be funded by the administration.

D. 1. The following are some environmental actions or activities. How likely do you think it is that you would take these actions or participate in these activities? Please circle the number that is closest to your opinion.

1 = very unlikely 2 = unlikely 3 = somewhat unlikely 4 = somewhat likely 5 = likely 6 = very likely

1. Telling your family to reduce use of detergent	1	2	3	4	5	6
2. Not throwing away bruised vegetables and fruits	1	2	3	4	5	6
3. Informing the school about dripping faucets	1	2	3	4	5	6
4. Watching TV programs about the environment	1	2	3	4	5	6
5. Advising neighbors not to dump illegally	1	2	3	4	5	6
6. Writing an article about the environment to persuade the public	1	2	3	4	5	6
7. Collecting articles about the environment	1	2	3	4	5	6
8. Writing a letter to EPA for law enforcement	1	2	3	4	5	6
9. Calling local EPA about polluting behaviors	1	2	3	4	5	6
10. Making a poster to increase schoolmates' environmental awareness	1	2	3	4	5	6
11. Turning off lights that are not needed	1	2	3	4	5	6
12. Cleaning drains in the school	1	2	3	4	5	6
13. Investigating where school waste water flows	1	2	3	4	5	6
14. Collecting and storing chemicals used in school's lab	1	2	3	4	5	6
15. Being a member of an environmental group	1	2	3	4	5	6

D. 2. Do you have experience with taking these actions or participating in these activities? Please indicate the frequency of your experience.

	Never	Sometimes	Usually
1. Telling your family to reduce use of detergent	1	2	3
2. Not throwing away bruised vegetables and fruit	1	2	3
3. Informing the school about dripping faucets	1	2	3
4. Watching TV programs about the environment	1	2	3
5. Advising neighbors not to dump illegally	1	2	3
6. Writing an article about the environment to persuade the public	1	2	3
7. Collecting articles about the environment	1	2	3

Figure 4.11, continued

Pre-Test Questionnaire

8.	Writing a letter to EPA for law enforcement	1	2	3
9.	Calling local EPA about polluting behaviors	1	2	3
10.	Making a poster to increase schoolmates' environmental awareness	1	2	3
11.	Turning off lights that are not needed	1	2	3
12.	Cleaning drains in the school	1	2	3
13.	Investigating where school waste water flows	1	2	3
14.	Collecting and storing chemicals used in school's lab	1	2	3
15.	Being a member of an environmental group	1	2	3

Please circle the number that shows how much you agree or disagree with the following statements about our ability to take part in the resolving environmental issues.

1 = strongly disagree 2 = disagree 3 = somewhat disagree 4 = somewhat agree 5 = agree 6 = strongly agree

1.	"I am too busy with schoolwork" is a barrier.	1	2	3	4	5	6
2.	"My parents rarely encourage me to take action" is a barrier.	1	2	3	4	5	6
3.	"School teachers rarely encourage me to take action" is a barrier for me.	1	2	3	4	5	6
4.	"Classmates will laugh at me if I take action for the environment" block my actions.	1	2	3	4	5	6
5.	"I lack knowledge about the environment" makes me hesitate to take actions.	1	2	3	4	5	6
6.	"I lack the skills needed to take action" is a barrier	1	2	3	4	5	6
7.	"I am confident enough to do it individually" made me not take action.	1	2	3	4	5	6
8.	"Students' actions have too little effect" block my action taking.	1	2	3	4	5	6
9.	"It is hard to cooperate with others to work for the environment" is one of the barriers for me.	1	2	3	4	5	6
10.	"Too few people take action" affects me to action taking awareness	1	2	3	4	5	6
11.	"Change cannot occur if only a few people do it" produces negative impact for my action taking.	1	2	3	4	5	6
12.	"Environmental issues are too complicated to solve" block my action taking.	1	2	3	4	5	6
13.	"Environmental pollution is too serious to improve" block my action.	1	2	3	4	5	6

E. Demographic information

Your gender: (circle your answer) male female

Your school name: City:

F. How many times have you gone to the river, including playing along the river bank? (Circle your answer.)

0 1-3 times 4-10 times 10-20 times more than 20 times don't remember

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Figure 4.12
Instructor Evaluation of the Cooperative Learning Strategy

Purpose

Group Members

Yes No 1. Did the group accomplish the stated purpose?
Yes No 2. Were all participants involved at an acceptable level?
Yes No 3. Was the composition of the group acceptable?
Yes No 4. If not, what changes should be made?

Figure 4.13
Student Evaluation of the Cooperative Learning Strategy

Directions: Circle either Yes or No for each item.

Yes No 1. Did the group complete the task?
Yes No 2. Did the group complete the task in the allotted amount of time?
Yes No 3. Did the group enjoy the task?
Yes No 4. As an individual, did you contribute to the group task?
Yes No 5. As an individual, did you contribute to helping the group finish on time?
Yes No 6. As an individual, did you enjoy the task?
Yes No 7. As an individual, did you feel all members participated actively?

Additional suggestions or concerns:

Figure 14.14
Teacher Attitude Survey

1. What is the most satisfying part of your job?
2. What is your favorite part of the day?
3. What unit of study is the most interesting for you to teach?
4. What do you like the most about working individually with a class?
5. Have you ever team taught? (If yes, answer below)
    - Likes:
    - Dislikes:
6. What do you consider to be your most successful unit of study? Why?
7. What do you consider to be your most frustrating unit of study? Why?
8. What was your most enjoyable unit of study? Why?

Figure 4.15

Student Interest Survey

Name of class:

We would like your honest opinion and suggestions regarding this class and how it compares to other classes you are in.

1. Which topics covered in this class did you find the most interesting?
2. Which topics covered in this class did you find the least interesting?
3. Which types of learning activities were used in this class?

___ Note taking from lecture
___ Small group discussion
___ Small group work
___ Field trip
___ Individual writing assignments
___ Individual reading assignments
___ Hands-on lab work
___ Work sheets, handouts
___ Combine work with other classes
___ Class discussion
___ Large group work
___ Group projects
___ Guest speakers
___ Group writing assignments
___ Group reading assignments
___ Videos
___ Individual assignments

4. Check the three (3) learner activities you found most enjoyable:

___ Note taking from lecture
___ Small group discussion
___ Small group work
___ Field trip
___ Individual writing assignments
___ Individual reading assignments
___ Hands-on lab work
___ Work sheets, handouts
___ Combine work with other classes

Figure 4.15, continued
Student Interest Survey

__ Class discussion
__ Large group work
__ Group projects
__ Guest speakers
__ Group writing assignments
__ Group reading assignments
__ Videos
__ Individual assignments

5. Check the three (3) learner activities that you found least enjoyable:

__ Note taking from lecture
__ Small group discussion
__ Small group work
__ Field trip
__ Individual writing assignments
__ Individual reading assignments
__ Hands on lab work
__ Work sheets, handouts
__ Combine work with other classes
__ Class discussion
__ Large group work
__ Group projects
__ Guest speakers
__ Group writing assignments
__ Group reading assignments
__ Videos
__ Individual assignments

6. Check the three (3) learner activities that made it easiest to learn:

__ Note taking from lecture
__ Small group discussion
__ Small group work
__ Field trip
__ Individual writing assignments
__ Individual reading assignments

Figure 4.15, continued
Student Interest Survey

__ Hands-on lab work
__ Work sheets, handouts
__ Combine work with other classes
__ Class discussion
__ Large group work
__ Group projects
__ Guest speakers
__ Group writing assignments
__ Group reading assignments
__ Videos
__ Individual assignments

7. Check the three (3) learner activities that made it most difficult to learn:
__ Note taking from lecture
__ Small group discussion
__ Small group work
__ Field trip
__ Individual writing assignments
__ Individual reading assignments
__ Hands-on lab work
__ Work sheets, handouts
__ Combine work with other classes
__ Class discussion
__ Large group work
__ Group projects
__ Guest speakers
__ Group writing assignments
__ Group reading assignments
__ Videos
__ Individual assignments

8. What information from this class will you remember longest?
9. What activities in this class will you remember longest?
10. If another student asked you about this class, what would you tell that person? Explain why.

A DI's Response to the Integrated Curriculum Project

In the summer of 1994 I became a team member involved in an integrated curriculum project at Spooner High School. This project was sponsored through the University of Wisconsin-Madison. Part of this project required written individual responses from team members. I understand the focus of these responses was to be descriptions of roles played by individual participants, and thoughts about strengths and weaknesses of the project.

Support comes by means of tutorial services in a resource center, designated instructors (DI's) in regular education classes, and team teaching approached in regular education classes.

During the 1994-95 school year, Spooner High School periodically combined a natural resources class with an advanced chemistry class. The focus of this combination was to study the water quality of a local river. The two classes obtained samples of river water, testing for various factors involved in water quality. These factors were calculated and charted to reveal a water quality index. From these indices interpretation and analysis were formed. A written summary of this interpretation and analysis followed in a partnership/group activity.

Many people were involved in this process, but the main participants included students of Spooner High School, and two teachers from the natural resources and chemistry classes. Support help was provided by a number of additional instructors. Support help included recording and filming progress, curriculum support, computer analysis, interpretation, clerical support, and instructional support. The main focus for me was instructional support for special education students in the natural resources class.

Knowledge varies among students and instructors regarding this project. If an intelligence curve of the student population participating in this project were drawn, my guess is that it would be bell-shaped. One part of this curve would be students with special needs. This is the population I focused on.

Spooner High School runs its special education department with an integrated focus. Students are mainstreamed into regular education classes. Support comes by means of tutorial services in a resource center, designated instructors (DI's) in regular education classes, and team teaching approached in regular education classes. My main role in the natural resources class was as a designated instructor.

As a designated instructor in the natural resources class, my responsibilities were to help students in communication processes, receiving and relaying information. A DI works with classroom curriculum material, and makes modifications to fit individual student needs.

As a designated instructor in the natural resources class, my responsibilities were to help students in communication processes, receiving and relaying information. A DI works with classroom curriculum material, and makes modifications to fit individual student needs. This may be as simple as helping a student analyze information in a set of directions, or may mean creating alternative sources to study curricular information.

Most of the time the individuals I instructed were with the main body of students. A few individual assignments in the project did require outside study time to complete. At these times I would help students in the resource room setting complete the writing process for assignments.

Many times help for the special education students came from classroom sources. For example, in the water quality project a great deal of group work was carried out. Many of the students I worked with were assigned a task in a group. This task was something they could handle without direct support from a DI.

Critiquing this experience would be difficult, as often I felt I was learning as much as the students. If I were to repeat the experience, I would definitely focus on a better knowledge base for myself, regarding the scientific aspects.

There were a great number of students in the combined classes. Often project steps would become bogged down as student (myself included) had to wait for the chemistry instructor's knowledge base to solve problems. If time had allowed, I would have liked to go through the experiments before the students. This was difficult to achieve, as the chemistry instructor and I went in different directions throughout the day.

This was the first year of exploring water quality in this manner for the two classes. This was also the first year I was assigned to be a DI in the natural resources classroom. A weakness I mentioned above was that time was limited in pre-planning activities. A great advantage of being a DI in a classroom is that our knowledge base grows as we repeat classes. If I were to repeat being a DI in natural resources, I would know more of the technical information. This would definitely aid me in helping my students with the higher level thinking skills required in many aspects of this project.

A last thought on this project. As the end of the year approached the closure for the project became weak. Again time became a factor. As this project is slated to continue the next school year, greater care can be taken to analyze, synthesize, and publish observations and recommendations. A natural next step for a project such as this is to use the results in a manner that would enhance the river's quality. This in turn would show a more direct connection to benefit the people of Spooner.

Dave Parish
Designated Instructor

A natural next step for a project such as this is to use the results in a manner that would enhance the river's quality. This in turn would show a more direct connection to benefit the people of Spooner.

A Parent's Response to the Integration Project

Dear Mr. Flynn:

I wanted to take a moment to tell you that I think it was a great idea of you and Mrs. Olson-Rosenbush to combine your classes for the water research project. Emily really enjoyed the time spent in the field and the lab with the other students. This is the practical application of today's important environmental issues that are frequently overlooked in our schools.

When I asked Emily how she liked working with the students from the natural resources class, she said, "It was neat! I never get to work with those kids." She went on to tell me how much she learned about the lab tests and the equipment. She was so enthusiastic, and it seemed like such a good idea that I had to write a note to give you some positive feedback.

Once again, thanks and keep up the great work!

Sincerely,
Suzanne Gerberding

Emily really enjoyed the time spent in the field and the lab with the other students. This is the practical application of today's important environmental issues that are frequently overlooked in our schools.

City of Spooner's Response to the Integration Project

Dear Mr. Flynn:

I've been asked to comment on a school project that is very important to me as a parent and as a concerned citizen. As a parent, I'm proud that my children, through the Spooner school system, have put environmental issues on a high priority list. They know that what we do to our water, soil, or air will directly affect what we do to ourselves. By having these students work with hands-on projects, i.e., sample water at Spooner's wastewater treatment plant or rivers through flow through our city, they have firsthand knowledge of environmental issues.

I wear a second hat, as the Superintendent of Utilities for the City of Spooner Utilities. I'm a wastewater treatment plant operator, water plant operator, and an electric power distribution foreman. I encounter all phases of environmental issues daily. When I hear the enthusiasm of a school system wanting to use some form of our city's operation for an outside study, I know and feel that whatever that teacher is doing surely will excite the students. As we tour our waste water treatment facility, there is no question that these students want to know and are eager to learn. I commend the school system.

Sincerely,
Alan R. Cusick
Superintendent of Utilities

Natural Resources Instructor's Response to the Project

In the summer of 1994 I became involved in the VALP Team. It was not without apprehension that I got involved. Being the Agriculture Instructor, I teach seven different classes already (two of which were new for the 1994-95 school year). Adding something more to my "plate" is rarely done without careful consideration to the value of the "something more" to my students. I am a member of the VALP Team because I could see an abundance of benefits for my students enrolled in Natural Resource Management.

As we got started planning our project, water quality testing, we could see that our largest barrier would probably be scheduling. The two classes involved were not offered at the same time.

This being our first year, we tried to keep the integrated project small enough so that it could be successful. The primary areas involved were agriculture and chemistry. As we got started planning our project, water quality testing, we could see that our largest barrier would probably be scheduling. The two classes involved were not offered at the same time. Having the Guidance Counselor on our team, we will make a concerted effort to schedule Natural Resources and Chemistry II at the same time in the future.

As the school year began and the project unfolded, there were some frustrations, but for the most part it appeared to be a success. My two biggest frustrations were time and communication. As the Agriculture Instructor, I am also the Future Farmers of America Advisor, not leaving much free time for working on a new project. Not having received some of the equipment we would be using until the school year began, I did not have an opportunity to run through the tests before my students did. This forced most of the students to rely on Larry Flynn, the chemistry instructor, to respond to their questions. This could be a difficult task because at times we were split into two classrooms. My other concern was communication. Larry and I teach in different buildings and we did not share preparation periods, which made communication difficult at times.

To get the project rolling, we introduced the two classes to one another by completing a few short procedures that related to water quality. The classes were combined and broke into teams, forcing them to work together. We progressed to the point where the students were collecting their samples, completing the water quality tests, and sharing and interpreting their results.

Discussing the integrated project with my students, many of them felt inferior to the Chemistry II students in the beginning. Many of the students

I see are special needs or at-risk students who do not display confidence in themselves. (A couple of examples: one of my students dropped out of school to marry her boyfriend who was being released from prison; another of my students was expelled for carrying a loaded gun to school.) As the school year progressed and my students became more familiar with the testing procedures, they lost their "inferiority complexes." It was a true joy to watch them as their understanding and confidence grew. On their final evaluation, they were asked to express the positive and negative aspects of the integrated project. Only one student did not like working with the "nerd herd"; the rest of the comments were very positive.

As the school year progressed and my students became more familiar with the testing procedures, they lost their "inferiority complexes." It was a true joy to watch them as their understanding and confidence grew.

This project will definitely be continued. Our hope is that as we continue, we can draw in different curricular areas such as biology and history. I believe it would also be beneficial to get our local community more involved, or at least more aware of what our students are accomplishing. Two of my students did have an opportunity to report the results of their water quality testing project to the Washburn County Board at the Land Conservation Committee's annual meeting. This is the type of activity I would like to see expanded.

Schools attempting to integrate curriculum must keep their lines of communication open and allow plenty of time for all involved to get together and discuss all aspects of the project. I consider this project to be a success and am proud to have been a part of it.

Susan Olson-Rosenbush
Instructor, Natural Resources

Chemistry Teacher's Response to the Integration Project

Chemistry II students typically are characterized with good attendance, good grades, and low dropout rate. Attached data support this. Several teacher observations were made concerning the effect of the integrated curriculum on attendance, grades, and dropout. They are as follows:

1. Twenty-five students in Chemistry II x 180 school days = 4,500 contact days. 120 total absences. 120 ÷ 4,500 x 100 = 2.63% absence rate. Attendance on days when integration occurred was nearly flawless, with the exception of the last water testing day that happened to fall on the non-school sponsored senior skip day. On that day, seven seniors were absent. This overall good attendance is extraordinary in light of the fact that Chemistry II students were asked to miss other classes in order to take part in the integration.

2. In terms of grades, all students benefited as a result of the integration. Those who particularly benefited were several average to below average Chemistry II students, but below average in terms of the Chemistry II curriculum.

In terms of grades, all students benefited as from the integration, in particular several average to below average Chemistry II students, but below average in terms of the Chemistry II curriculum.

3. Two Chemistry II students dropped the class at semester. Both had passing grades as a result of the integration. Both also enjoyed the integration, but found the rest of the Chemistry II curriculum overwhelming.

Larry Flynn
Instructor, Chemistry II

(Text continued on page 192)

Figure 4.16
Final Grades for Chemistry II Students, 1994-95

Course: **SCHE2 Chemistry II**
Section: **01**
Teacher: **Mr. L. Flynn**
Room: **361**
Building: **Spooner High School**

Date: **6/9/95**
Time: **13:36:45**
Term: **Year**
Grade Range: **11-12**
Cor Type: **H**
Subject: **Science**

		GD	Q1	Q2	EX1	S1	Q3	Q4	EX2	S2
1	Female	12	(B)	(B-)	( )	(B-)	(C+)	(B-)	( )	(B-)
2	Female	11	(A-)	(A-)	( )	(A-)	(A)	(B+)	( )	(A-)
3	Female	12	(B+)	(B)	( )	(B)	(B)	(B)	( )	(B)
4	Female	12	(B)	(A-)	( )	(B+)	(A-)	(C+)	( )	(B)
5	Male	11	(B+)	(B)	( )	(B)	(C+)	(B)	( )	(B-)
6	Female	11	(B)	(A)	( )	(A-)	(A-)	(B+)	( )	(A-)
7	Male	11	(B)	(C+)	( )	(B-)	(C+)	(B-)	( )	(B-)
8	Female	11	(B-)	(C)	( )	(C+)	(C-)	(C)	( )	(C)
9	Male	11	(C)	(D)	( )	(D+)	(C)	(D+)	( )	(C-)
10	Female	12	(A)	(A)	( )	(A)	(A)	(A)	( )	(A)
11	Female	11	(C)	(C+)	( )	(C+)	(B-)	(C)	( )	(C+)
12	Male	12	(B-)	(C-)	( )	(C)	(C-)	(A)	( )	(B)
13	Female	12	(B-)	(B-)	( )	(B-)	(B+)	(C)	( )	(B)
14	Female	12	(A-)	(B)	( )	(B+)	(A)	(A-)	( )	(A-)
15	Male	11	(A-)	(B+)	( )	(B+)	(B)	(B)	( )	(B)
16	Male	11	(A)	(A-)	( )	(A)	(A)	(A)	( )	(A)
17	Male	11	(C+)	(D-)	( )	(D+)	(C)	(C)	( )	(C)
18	Female	12	(A-)	(A)	( )	(A)	(A+)	(A)	( )	(A)
19	Male	11	(A)	(A)	( )	(A)	(A)	(A-)	( )	(A)
20	Female	11	(A)	(A)	( )	(A)	(A+)	(A)	( )	(A)
21	Female	11	(A)	(A)	( )	(A)	(A)	(A)	( )	(A)
22	Male	11	(B)	(B-)	( )	(B-)	(C+)	(B+)	( )	(B)
23	Female	12	(B)	(A-)	( )	(B+)	(B)	(B)	( )	(B)

25 students 1st semester (9 = M, 16 = F)

23 students 2nd semester (8 = M, 15 = F)

Figure 4.17
Final Grades for Natural Resource Management 1994-95

Student	Grade	Q1	Q2	SEM	Q3	Q4	SEM
1 Female	10	(A-)	(B+)	(A-)	(A)	(B)	(A-)
2 Male	10	Moved to another school district					
3 Male	10	(B)	(B+)	(B)	(A)	(B+)	(A-)
4 Male	10	(D)	(C-)	(D)	(B-)	(A-)	(B)
5 Female	11	Dropped from school					
6 Male	11	(D)	(D)	(D)	Dropped from school		
7 Male	11	(D-)	(F)	(F)	Expelled from school		
8 Male	11	(C)	(C)	(C)	(F)	(C)	(D)
9 Male	11	(C)	(B)	(C+)	Dropped from class		
10 Male	12	(D)	(F)	(D-)	(F)	(C-)	(D)
11 Male	12	(C)	(D)	(D+)	(F)	(F)	(F)
12 Male	12	(C+)	(B)	(B)	(B+)	(B)	(B+)
13 Female	12	(C)	(C)	(C)	(C)	(D+)	(C-)
14 Male	12	(D)	(F)	(F)	(B-)	(B)	(B)
15 Male	12	(C)	(B)	(B)	(B)	(B)	(B)
16 Male	12	(C)	(D)	(C-)	(B)	(C)	(B-)
17 Male	12	(C)	(D+)	(C-)	(B)	(D)	(C)
18 Male	12	(B)	(B)	(B)	Scheduled only for 1st semester		
19 Male	12	(B)	Moved to another district; returned		(C)	(F)	(D)

The beginning enrollment was 19 students. In all cases, student grades were raised by their involvement in the water quality testing project. Ending enrollment was 13 students, due to the reasons noted in the above table.

Many in the agriculture classes are at-risk students who have a tendency to have a higher number of absences. When studying the attendance of this particular group, data showed that very few students missed school on days when the combined group conducted integrated water quality testing. On the average, the Natural Resources students as a group missed 55 days per quarter, but only four of those absences were during the integrated project.

Summary and Suggestions for Replication

Spooner School District integrated two seemingly diverse subjects as well as two groups of very diverse students using an on-going theme of water quality analysis. This theme allowed the students to apply directly the chemistry concepts and analysis methods that, for the advanced students, were normally treated in the realm of the abstract, and for the at-risk students were seldom if ever covered at all. Those wishing to replicate this effort should consider the following steps.

Spooner School District integrated two seemingly diverse subjects as well as two groups of very diverse students using an on-going theme of water quality analysis.

- Restructure staff roles and duties in order to provide effective instructional support. Consider using the DVI approach as the design of choice in order to enhance the chances that students will succeed in the integrated learning environment.
- Use volunteers to initiate integration efforts, rather than mandating participation.
- Allocate sufficient time and resources so that staff can carry out the intense and sustained planning and curriculum development work needed to institute a significant curriculum integration effort such as described in this chapter.
- Involve all key stakeholders in planning and developing these changes.
- Revise staff schedules and work assignments as needed. Do not merely add new tasks to staff members' current duties. A massive restructuring effort cannot be developed or implemented successfully when planning and preparation are added to participants' existing work loads.
- Ensure that proposed changes in curricula, instructional approaches, instructional support strategies, and scheduling are in ready to go when it is time to implement them. Efforts to put the finishing touches on proposed restructuring of this magnitude after it starts are almost always stymied by unforeseen events.

Biotechnology Integration Project

5

Developed by the VALP Team of Wauwatosa East High School
Compiled by Lloyd W. Tindall, Center on Education and Work

Key Features

The Biotechnology Integration Project integrated science, mathematics, English, technology, and business education to teach the unit on microbiology in a different manner. Through this integration project, students participated in hands-on learning while also developing their laboratory skills. In addition to the focus on microbiology and the various content areas, career exploration and employability skills were also focal points in this project. In the future, this project will serve as a gateway to the Biotechnology Youth Apprenticeship Program at Waukesha County Technical College.

The Biotechnology Integration Project integrated science, mathematics, English, technology and business education to teach the unit on microbiology in a different manner.

Demographic Information

Wauwatosa, Wisconsin, is a suburban community of approximately 50,000 residents. Located in Milwaukee County, Wauwatosa also serves as the home of the County Medical Complex.

Wauwatosa East High School has an enrollment of approximately 1,200 students. More than 80% of graduates continue their schooling, with nearly 70% attending four year colleges or universities. Currently, 11th and 12th grade students have the opportunity to take advanced classes in biology, chemistry, and physics and receive articulated credit from Milwaukee Area Technical College (MATC) for certain course work.

Students at Wauwatosa East also have the option to participate in an Advanced Independent Research (AIR) class, which is a community-based class that is jointly conducted under the guidance of an on-site, professional researcher and a high school teacher. Various institutions in the area are used as AIR placement sites, including the following: the Medical College of Wisconsin, the Veterans Administration Hospital, Marquette University, and the University of Wisconsin–Milwaukee.

Additionally, the possibility of articulating a biotechnology youth apprenticeship program with Waukesha County Technical College (WCTC) is being discussed. Through this apprenticeship, students could receive twelve college credits, with some credits being transferable to UW–Milwaukee.

In the future, the project will serve as a gateway to the biotechnology youth apprenticeship program.

Participant Information

Thirty students in the ninth grade, including those with special educational needs, were randomly selected to participate in the Biotechnology Integration Project. A letter explaining the project and requesting consent to video tape was sent to each student's parents prior to the project's beginning. A copy of this letter can be seen in *Figure 5.1, Informational Letter to Parents.*

Figure 5.1
Informational Letter to Parents

Wauwatosa School District
Wauwatosa East High School · 7500 Milwaukee Avenue · Wauwatosa, WI 53213 · (414) 778-6565

August 30, 1994

Dear Parents of

Your student has been scheduled into a biology class, an English class, and an algebra class, all of which will be doing integrated work during the third quarter of this year. Through a special grant in cooperation with the University of Wisconsin, this Biotechnology Integration Project will serve as a gateway to generate interest in science, provide career awareness for students, and create a pool of applicants for East's Biotechnology Youth Apprenticeship Program.

This integrated project in which your student is participating this year will provide students with hands-on learning experiences while developing their laboratory skills. Technology will be integrated when the students view a CAD demonstration and actually construct electrophoresis boxes which will be used to conduct experiments in the advanced biology lab. In English, the students will read and discuss the biotechnological applications of the novel *The Andromeda Strain*. In addition, throughout the year English class will focus on career exploration in biotechnology. The integration of algebra will occur when mathematical applications such as equations, formulas, measuring, and graphing are required to conduct lab experiments. Business education teachers will introduce spreadsheets for use in calculating data and graphing.

Since this Biotechnology Integration Project is a bridge to the Youth Apprenticeship Program and real life work experiences, employability skill development will be the focus throughout the integration project. Attendance, punctuality, adherence to safety rules and other job keeping skills will be addressed. This project will develop problem-solving and decision-making skills as well as the ability to work cooperatively with other team members.

As a part of our program assessment, we are required by the grant to provide some videotape footage of students in action during our classes. We have enclosed a permission form for you to sign and return. Thank you for your cooperation.

Sincerely,

Linda Barrington, *English*
Glenn Garski, *Algebra*
Patricia Zelewski, *Biology*

Students participating in this project were all scheduled to take biology, algebra, and English during the third quarter. As part of the integration, they were scheduled to take these three courses together, and moved from biology, to algebra, to English as a group. Ten percent of the students involved in this project were students with special needs, and included learning disabilities and hearing impairment.

VALP Team Information

Twelve VocationalAcademic Learning Program (VALP) team members were involved in the planning and implementation stages of this integration project. Below is a list of the VALP team members involved with the Biotechnology Integration Project.

Linda Barrington - English Teacher
Roger Barrington - Special Education Teacher
Ron Fager - Technology Education Teacher
Glenn Garski - Algebra Teacher
Scott Kellogg - Director of Curriculum and Instruction
Joyce Larson - Teacher for the Hearing Impaired
Sherry MacDonald - Special Education Teacher
Tom Marlett - Mathematics Teacher
Pam McGuire - Project Leader, School to Work Coordinator
Kathy Reed - Business Education Teacher
Tom Steiner - Associate Principal
Patricia Zelewski - Project Manager, Biology Teacher

Ten percent of the students involved in this project were students with special needs

▲ *VALP team members left to right (bottom row) Pam McGuire, Joyce Larson, Linda Barrington, Patricia Zelewski; (top row) Roger Barrington, Ron Fager, Tom Marlett, Glenn Garski, Sherry MacDonald, Kathy Reed.* ▲

Members of the VALP team each had different responsibilities, and were involved in varying degrees during the planning and implementation phase of the project. Some teachers, including Ms. Zelewski, Mrs. Barrington, and Mr. Garski, were actively involved every day; while Mr. Fager and Ms. Reed were involved for certain integrated activities on a less frequent basis. Mr. Marlett attended VALP team training in Madison and provided input on math integration.

Ms. Larson and Ms. MacDonald provided support services and intervention throughout the project. Ms. McGuire, the school-to-work coordinator, worked in establishing agreements with postsecondary schools and businesses and worked on obtaining funding for other school-to-work projects. Mr. Kellogg provided additional funding for project needs (e.g., report covers, additional computer memory, and substitute teacher pay). Substitute teachers were provided when students were in the business or technology laboratories. When Ms. Zelewski needed additional time to prepare for integrated activities and videotaping, Mr. Steiner covered her class. Mr. Barrington assisted with scheduling at the beginning of the school year, and arranged class schedules for the project.

Project Goals

Members of the VALP team each had different responsibilities, and were involved in varying degrees during the planning and implementation phase of the project.

This project was developed to provide a pool of students for the Biotechnology Youth Apprenticeship program through the integration of vocational and academic education, while also, in an effective manner, meeting the needs of students from special populations. In addition to the above mentioned goals, other objectives developed by the VALP team included the following:

1. The Biotechnology Integration Project will prepare a diverse student population for work and make academic learning real.
2. The Biotechnology Integration Project will facilitate the link between academic and vocational programs at the secondary educational level.
3. The Biotechnology Integration Project will focus on the industry of biotechnology further enhancing the youth apprenticeship program, as well as career awareness for all students.
4. The Biotechnology Integration Project will bridge school and work partnerships.

The VALP team formulated their own definition of integrated vocational and academic learning which served as the foundation for their project. This definition states: "We believe that integrated vocational and academic learning will prepare a diverse student population for work and make academic learning more real. We hope it will inspire interest in academic and vocational programs at the secondary level."

Project Design

The Biotechnology Integration Project integrated science, mathematics, English, technology, and business education to focus on microbiology. Thirty students were randomly selected to participate in the project and were scheduled to take the same biology, English, and algebra classes during the third quarter. The microbiology unit provided students with hands-on learning and allowed them to further develop their laboratory skills.

Visible Relationships

This integrated unit allowed students to see important relationships between the content areas. In English, the students read and discussed the novel *The Andromeda Strain,* and completed a career exploration unit covering various careers related to biology and science. In algebra, mathematical applications such as equations, formulas, and measuring were related to the lab experiments being conducted in biology. Students also used graphing calculators to plot results of their experiments. Additionally, the math instructor covered binary numbers just prior to their appearance in *The Andromeda Strain.*

This integrated unit allowed students to see important relationships between the content areas.

The integration of technology education occurred when the students constructed electrophoresis boxes which were later used by the Advanced Independent Research students when they conducted trial experiments. Biology students used computers to develop a multimedia report, and incorporated business education skills to word process reports and create spreadsheets used to calculate and graph data.

Since the Biotechnology Integration Project will serve as a bridge to the Youth Apprenticeship Program and real life work experiences, employability skill development was also a primary focus throughout the integration project. Attendance, punctuality, adherence to safety rules, and other job keeping skills were consistently stressed. Through this project, students were able to enhance problem solving and decision-making skills, as well as their ability to work cooperatively with others.

Project Planning

To effectively integrate the various subject areas, an initial plan, shown in *Figure 5.2, Action Plan* was developed during the summer. It was used to outline the tasks to be completed, activities required to achieve each task, and the skills needed to perform each activity. Additionally, the persons responsible, the expected completion date, necessary resources, and videotaping arrangements were also detailed. This plan of action was extremely helpful during the implementation phase of the project.

Through this project, students were able to enhance problem solving and decision-making skills, as well as their ability to work cooperatively with others.

Curricula and Implementation Considerations

Curricula for the Biotechnology Integration Project were developed in accordance with the state curriculum for biotechnology, which outlines the duties and tasks which should be introduced, practiced, and mastered in order to receive articulated credit in this area. Below, the nine duties and their subsequent tasks are outlined as they appeared in a draft from the Milwaukee Area Technical College (MATC) dated April 14, 1995. Please note the following key, which explains some of the letters seen after some tasks.

Key

F = first year
S = second year
W = workplace
I = introduction
P = practice
M = mastery

(Text continued on page 203)

DEVELOPING INTEGRATED VOCATIONAL AND ACADEMIC LEARNING PROGRAMS

Figure 5.2, Action Plan

Action Plan	**Wauwatosa East High School**
Curricula Subjects to be Integrated	**Grade Level of Integrated Curricula**
Biology, English, Mathematics, Technology Education, Business Education	Grade 9
Length of Integrated Approach	**# of Students**
Third quarter of the 1994-1995 school year	30

Objective

1. To prepare diverse student populations for work and make academic learning real
2. To facilitate the linke between academic and vocational programs at the secondary level
3. Focus on the industry of biotechnology further enhancing the youth apprenticeship progrm and career awareness for all students
4. To bridge school and work partnerships

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
1. To integrate biology and technology			lab book equipment textbook		
A. Build electrophoresis boxes					
1. Background knowledge of genetics and microbiology	Patti	March			
2. CAD demonstration of construction of box	Ron	March	CAD	X	
3. Basic shop safety and rules; terminology	Ron	March	Handout	X	
4. Actual design and construction of boxes	Ron/Patti/Glen/Liz	March	Bldg. supplies		

Figure 5.2, continued

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Videotape	
				Yes	No
5. Quality control (tolerance level of error)	Tom/Glen	March	Graphing calculators		
2. To integrate biology, English, and career awareness	Linda/Roger/ Patti	March			
A. Read the *Andromeda Strain* (science fiction book about bacteria)			Books		
1. Discussion of biotechnological applications as presented in the novel				X	
2. Essays regarding novel					
B. Career exploration in biotechnology	Linda/Patti		Guest speakers	X	
1. Composition utilizing film and library research					
2. Multimedia report using Linkway program			Computers	X	
3. Introduction to Youth Apprenticeship program	Diane		CC brochure	X	
3. To integrate biology and algebra	Glen/Tom	Feb./March	Algebra book Biology book		
A. Measurement and plate counts			Lab equipment		
B. Manual graphic of plate counts					
C. Use of equations					
D. Fractions and serial dilution					
E. Determination of formula for curve			Graphing calculators		

Figure 5.2, continued

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Videotape	
				Yes	No
4. To integrate biology and business education	Patti/Glen/ Kathy	Oct./March	Computer lab	X	
A. Use of work processing for reports					
B. Introduction of spreadsheets for use in calculating data					
C. Use of spreadsheets for graphing					
5. To integrate biology and human services	Patti/Vicki	April			
A. Food science					
1. Discussion of bacteriology and food preservation					
2. Food lab project: making yogurt from scratch			Food lab supplies		
B. Universal Foods field trip					
6. To incorporate hands-on learning in microbiology	Patti	March	Lab equipment/supplies	X	
A. Observation of organisms					
B. Media preparation utilizing lab					
C. Application of culture techniques and slide preparation					
D. Completion of the basics of DNA gel electrophoresis					
E. Oral presentation of lab results to biology class					

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Figure 5.2, continued

1. Tasks **A. Activities required to achieve each task** **B.**	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
7. Incorporation of knowlledge of employability skills	All	Ongoing	Video		
A. Emphasis on attendance and punctuality					
B. Respect for worksite rules					
1. Lab safety	Patti				
2. Shop safety	Ron				
3. Computer lab rules	Kathy				
C. Incorporation of problem-solving and decision-making skills					
D. Cooperation with team/group members					
8. Integrated assistnace for special needs and at-risk students		Ongoing			
A. Provide assistance with the reading of *The Andromeda Strain*					
1. Reading specialist	Liz				
2. Special education teacher	Roger				
B. Use of multimedia system as part of classroom presentation	Patti		software, hardware,TV & VCR		
C. Check into audio version of biology textbook	All	Sept.			

Figure 5.2, continued

1. **Tasks** A. **Activities required to achieve each task** B.	**Person(s) Responsible**	**Expected Completion Date**	**Resources Needed/ Provided By**	**Videotape**	
				Yes	**No**
D. Incorporation of strategies for special needs students					
1. Group activities/teamwork					
E. Establishment of tutors for students	Patti	October	National Honor Society	X	
F. Advanced biology class to develop a class presentation	Patti	April		X	

Duties & Tasks for Youth Apprenticeship in Biotechnology

Employability Skills

- Follow a schedule
- Demonstrate effective use of resources
- Demonstrate team planning, problem solving, and communications process involved in teamwork
- Develop conflict resolution and consensus building techniques
- Describe the overall organization and technological system
- Process information using computers

Communication

- Follow protocol (F-I)
- Keep accurate records (F-I)
- Write technical summaries (F-I, P)
- Organize and present oral summaries (F-I, P)
- Locate and review reference materials
- Comprehend a technical vocabulary
- Read current scientific publications
- Prepare drafts of protocols

During the first year of biology, students are introduced to basic laboratory skills.

Safety

- Identify first aid supplies, personnel, and emergency protection areas (F-I, P)
- Keep work areas free form clutter (F-I,P)
- Use appropriate safety procedures and guidelines (F-I, P)
- Monitor, use, store, and dispose of hazardous materials properly (F-I, P)
- Use protective equipment
- Use hoods
- Store and dispose of hazardous materials per MSDS
- Maintain safety equipment
- Recognize common lab hazards
- Recognize safety symbols and signs
- Comply with regulation per federal, state, and local agencies

Basic laboratory skills

- Practice aseptic techniques (F-I)
- Prepare glassware (F-I)
- Perform mathematical calculations and conversions (F-I)
- Make stock reagents and solutions
- Monitor physical properties or a solution
- Sterilize reagents and solutions
- Make and dispense media
- Maintain reagent integrity
- Maintain inventory of personal laboratory supplies
- Communicate with vendors
- Use basic weighing and measuring techniques
- Use scientific method

Basic microbiology

- Identify and quantify microorganisms (F-I)

- Maintain pure cultures (F-I)
- Maintain and analyze fermentation materials (S-I, W-P)
- Monitor fermentation equipment
- Harvest cells
- Transform hosts

Cell biology techniques

- Characterize cell lines (S-I, P)
- Culture plant or animal tissue (F-I)
- Use microscopes (F-I)
- Perform cytological tests (e.g, staining) (F-I)
- Perform bioassays

Quality control

- Perform validation testing
- Use analytical equipment
- Document product specifications (S&W-I, P)
- Collate data
- Analyze data
- Compare results to government and company standards

To incorporate each of the above duties and tasks, the content of the integrated curriculum was outlined to include each subject area and the content related, integration topics.

Nucleic acid techniques

- Isolate nucleic acids
- Perform restriction digests
- Perform gel electrophoresis (F-I, S&W-P)
- Stain nucleic acids
- Detect specific nucleic acid sequences
- Perform basic cloning techniques

Protein techniques

- Detect specific proteins (F-I, P)
- Separate, isolate or characterize proteins
- Concentrate proteins
- Perform protein assays

Content of the Integrated Curricula

In order to incorporate each of the above duties and tasks, the content of the integrated curriculum was outlined as follows and shows each subject area and content related integration topics.

Algebra

- ☐ Measurement, plate counts
- ☐ Graphing, plate growth
- ☐ Equations, Beer-Lambert Law (spectrophotometry)
- ☐ Fractions, serial dilution

English

- ☐ Literature, *The Andromeda Strain* (science fiction about bacteria)
- ☐ Essays regarding the novel and careers
- ☐ Career exploration, film and library research

- ☐ Linkway Live!

Biology
- ☐ Characteristics of microbiological organisms
- ☐ Purpose and tissue of microbiological organisms
- ☐ Equipment and media preparation
- ☐ Culture techniques
- ☐ Slide preparation including staining procedures
- ☐ Basics of DNA gel electrophoresis

Technology Education
- ☐ Lab skills, safety, introduction to tools
- ☐ Equipment, students will make electrophoresis boxes

Business Education
- ☐ Data processing, word processing, graphics program skills

Human Services
- ☐ Food science
- ☐ Universal Foods field trip

Daily Lessons

In order to integrate the primary topic areas into the microbiology unit, teachers in biology, English, and algebra had to determine how and when to integrate these subject areas. In general, each teacher had ideas for the integration process, but in order to be successful in this effort, daily lesson plans had to be incorporated.

Topics for daily integrated lessons are further detailed in *Figure 5.3, Project Timeline*. Daily lesson topics in biology, English, and algebra are documented to show the relationship between the content areas. The time line also shows when other subject areas, such as technology and business education, were integrated. Some changes occurred in the daily plans for English and biology; therefore, the time line compares the predicted accomplishments to what was actually completed.

Integrated Activities

Rather than creating an entirely "new" curriculum for each subject area, the VALP team decided to adapt the existing curricula to integrate vocational and academic education. In order to make the Biotechnology Integration Project work, academic teachers modified their curricula to focus on biotechnology, and vocational teachers complemented classroom activities with labs to incorporate the vocational subject areas.

Rather than creating an entirely new curriculum for each subject area, the VALP team decided to adapt the existing curricula in order to integrate vocational and academic education.

For example, Ms. Barrington related English activities and the ninth grade career unit curriculum to the microbiology unit. The English class read the novel *The Andromeda Strain*, and discussed the biotechnological applications described. To provide examples of women in non-traditional careers, the class studied women in the science field. A poster kit was purchased to highlight some of these occupations and their related duties. Students viewed each of the poster presentations, took notes on a specific scientist, and then

(Text continued on page 214)

Figure 5.3
Project Timeline

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Mon 1/23	1	Homework for day 1 - Read chapter 16.1; Worksheet directed reading; compel presentation up to media; HW for day 2 - read "Microbiological Techniques"	Class notes the diversity of fungi; HW for day 1 - read p. 826, "The Kingdom Fungi"		8.1: Rate of change	Begin poetry unit	
Tue 1/24	2	Compel presentation - the rest of the definitions	HW for day 2 - read ch. 18.1; Worksheet: Directed Reading Ch. 18.1		8.2: Constant rates of change	Poetry	
Wed 1/25	3	Quiz - vocabulary; clean glassware for labs	HW for day 3 - worksheet: Structures of Fungi; Class: notes, start lab		8.3: Properties of slope	Poetry	
Thu 1/26	4	Compel definitions - flagella, capsule, etc.	Lab: A Population Explosion in a Test Tube		8.4: Slope-intercept equation for lines	Poetry	
Fri 1/27	5	Preview lab together: How and Where Do Bacteria Grow? HW - read lab again for Monday	Test - fungi		8.5: Equations for lines with a given point and slope	Poetry	

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Mon 1/30	6	Plate bacteria for lab: How and Where Do Bacteria Grow?	HW for day 6, ch. 16.3, wksht: directed reading ch. 16.3, wksht: directed reading ch. 16.3; class - wksht: The Development of Virology; HW - read pp. 450-1		8.6: Equations for lines through two points	Poetry	
Tue 1/31	7	Brainstorm rules for bacteria presentations; hand out articles and assign groups	HW for day 7, read "New Defenses Against Common Cold Found," & answer ?'s; class - worksheet: Viral Invasion and the Body's Response		Continued from day 6	Poetry	
Wed 2/1	8	Examine plates; HW - work on lab answers	Test		8.7: Fitting a line through data	Poetry	
Thu 2/2	9	Look at plates, work on presentations; HW - work on presentations, finish lab questions	Classwork - lecture; HW - day 9, read p. 823: The Kingdom Monera; read ch. 16.1; worksheet: Directed Reading Chapter 16.1		Continued from day 8	Poetry	

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Fri 2/3	10	Work on presentations	Worksheet: Identifying Unknown Bacteria		8.8 : Equations for all lines	Poetry	
Mon 2/6	11	Brainstorm what a proper presentation consists of	HW for day 11 - read lab: Microbiological Techniques; class see presentation (compel)		8.9: Graphing linear inequalities	Poetry	
Tue 2/7	12	Presentations	Continued from day 11		Review	Poetry test	
Wed 2/8	13	Finish presentations; answer 16.1 questions; HW - 16.2; and read article "Escaping pain: Professor's deadly toxin helps many"	Lab: How and Where Do Bacteria Grow?		Test/Binary Numbers	Hand out *Andromeda Strain*, give directions for vocabulary; assign pp. 9-32 for Friday. Read.	
Thu 2/9	14	Antibody, antigen discussion	Continued from day 12		Binary numbers; 9.1: Compound interest	Career Lesson 10	Career Lesson 5
Fri 2/10	15	Quiz; compel presentation on diseases, HW - population growth curves	Worksheet: Population Growth Curves		9.2: Exponential growth	Discuss reading. Have them explain binary numbers and how they work. Enter vocabulary work on spreadsheet. Assign pp. 35-60 for Tuesday.	

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Mon 2/13	16	Discuss pop. growth curves; lab - using random sampling; HW - *A Study in Human Population Growth*	Lab: Using Random Sampling		9.3: Exponential decay	Career Lesson 11	Career Lesson 6
Tue 2/14	17	Students go to Mr. Garski for Algebra	Students go to Mr. Garski for Algebra	Hour 3 for spreadsheet review, handout will be provided	9.4: Graphing exponential growth and decay	Discuss reading. Enter vocabulary on spreadsheet. Assign pp. 60-123 for Friday.	Discuss reading. Enter vocabulary on spreadsheet. Assign pp. 60-123 for Friday.
Wed 2/15	18	Computer Lab: *A Study in Human Population Growth*		Hour 3 - graphing biology lab on Lotus	9.5: Products of powers	Intro. to LinkWay Live	Career Lessons 7, 8
Thu 2/16	19	Go over *A Study in Human Population Growth*			9.6: Negative exponents	Continue learning LinkWay Live	Career Lessons 9, 10
Fri 2/17	20	Notes: Gram staining; HW - read over lab	HW for day 20 - read ch. 16.2; worksheet: Directed Reading Chapter 16.2; class - lab: What Kills Germs?		9.7: Quotients of powers	Discuss reading. Quiz on day 1 and day 2. Enter vocabulary on spreadsheet. Assign pp. 127-164 for Wednesday.	

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Tue 2/21	21	Gram staining; HW - Ch. 32, ?'s p. 741	Read cheese making diagram and chart		9.8: Powers of products and quotients	Continue learning LinkWay Live	Career lesson 11: Career research and orientation in Career Center
Wed 2/22	22	Gram staining; HW - Ch. 32, ?'s p. 747	Lab: Using Bacteria to Make Food		9.9: Remember the properties	Discuss reading. Enter vocabulary on spreadsheet. Assign pp. 165-215 for Monday.	
Thu 2/23	23	Gram staining; HW - Ch. 32, ?'s p. 754	Continued from day 22		Continued from day 22	Career Lesson 12 in Career Resource Center	Career speaker: funeral director
Fri 2/24	24	Short Test - Gram staining; HW - study	Read article "Escaping pain: Professor's deadly toxin helps many"		Review	Career Lesson 12 continued.	
Mon 2/27	25	Go over all labs and HW	Biogenetic engineering lecture		Test	Discuss reading. Enter vocabulary on spreadsheet. Assign rest of book for Friday.	Discuss reading. Enter vocabulary on spreadsheet. Assign to ch. 24 for Thursday.
Tue 2/28	26	Microbiology slides, and compel Gram staining review	Students go to tech lab to build electrophoresis boxes		Polynomials	No English class—in tech lab.	Quiz on ch. 12-20; catch-up day on computers, working on vocabulary.

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Wed 3/1	27	Compel presentation on Gram + and -, cell wall comparison and medical significance; HW - Ch. 32, review 1-21, due Mon.	Continued from day 26		continued	No English—in tech lab.	Career Center—final work day to do research
Thu 3/2	28	Video on careers in the medical laboratory	Continued from day 26		continued	No English class—in tech lab.	Discuss ch. 23-24; assign rest of book for Monday. How to give speeches; how they will be assessed.
Fri 3/3	29	Quiz; notes/discussion of foods and bacteria; cheese making	? continued from day 26 or test; review		continued	Discuss reading. Quiz on days 3, 4, and 5. Enter vocabulary on spreadsheet. Print out spreadsheet by end of hour to hand in. Assign essay to take place of standard test.	Final work day on computers
Mon 3/6	30	Lab: making yogurt/foods and bacteria notes; HW - read *Biotechnology: An Introduction*	Test		continued	Use LinkWay to create career report	Discuss rest of the book; finish vocabulary and print.

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Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Tue 3/7	31	Compel presentation on biotechnology				Continue career report.	Test on last part of book. Begin watching video of *Andromeda Strain*.
Wed 3/8	32	Compel presentation on biotechnology				Essay due. Last day to finish career reports.	Continue video; vocabulary due.
Thu 3/9	33	Compel presentation on biotechnology; discussion of gel electrophoresis; showed them a gel and the equipment				Presentation of LinkWay career reports.	continue video
Fri 3/10	34	More on biotechnology				Presentation of LinkWay career reports.	Finish video; draw numbers for speeches on careers
Mon 3/13	35	Electrophoresis boxes in tech lab				Build electrophoresis boxes	Final work day to prepare speeches
Tue 3/14	36	Electrophoresis boxes in tech lab				Build electrophoresis boxes	Present 13 speeches

Figure 5.3, continued

Date	Day	Biology (what we did)	Biology (what we projected)	Business Education	Algebra	English (what we projected)	English (what we did)
Wed 3/15	37	Finish biotechnology, compel presentation, answer questions					Present rest of speeches
Thu 3/16	38	Test review					
Mon 3/20	39	Microbiology test					
Tue 3/21	40	Viruses					

told a partner what he/she learned about that individual and his/her contribution to science.

Another component of the career unit involved having guest speakers from the various science related occupations speak to and interact with the English class. Below is a list of the occupational areas covered in the guest lectures:

- dentist
- waste management engineer
- biologist
- health information
- speech and language pathologist
- occupational therapist
- funeral director

Prior to their presentation, each business person was sent a confirmation letter (see *Figure 5.4, Informational Letter to Employers*) and a copy of the form students would be using to take notes during their presentation (see *Figure 5.5, Speaker Presentation Form*). Students were not graded on their note-taking and instead were encouraged to become actively involved in the presentations by asking questions to help them learn about each career area.

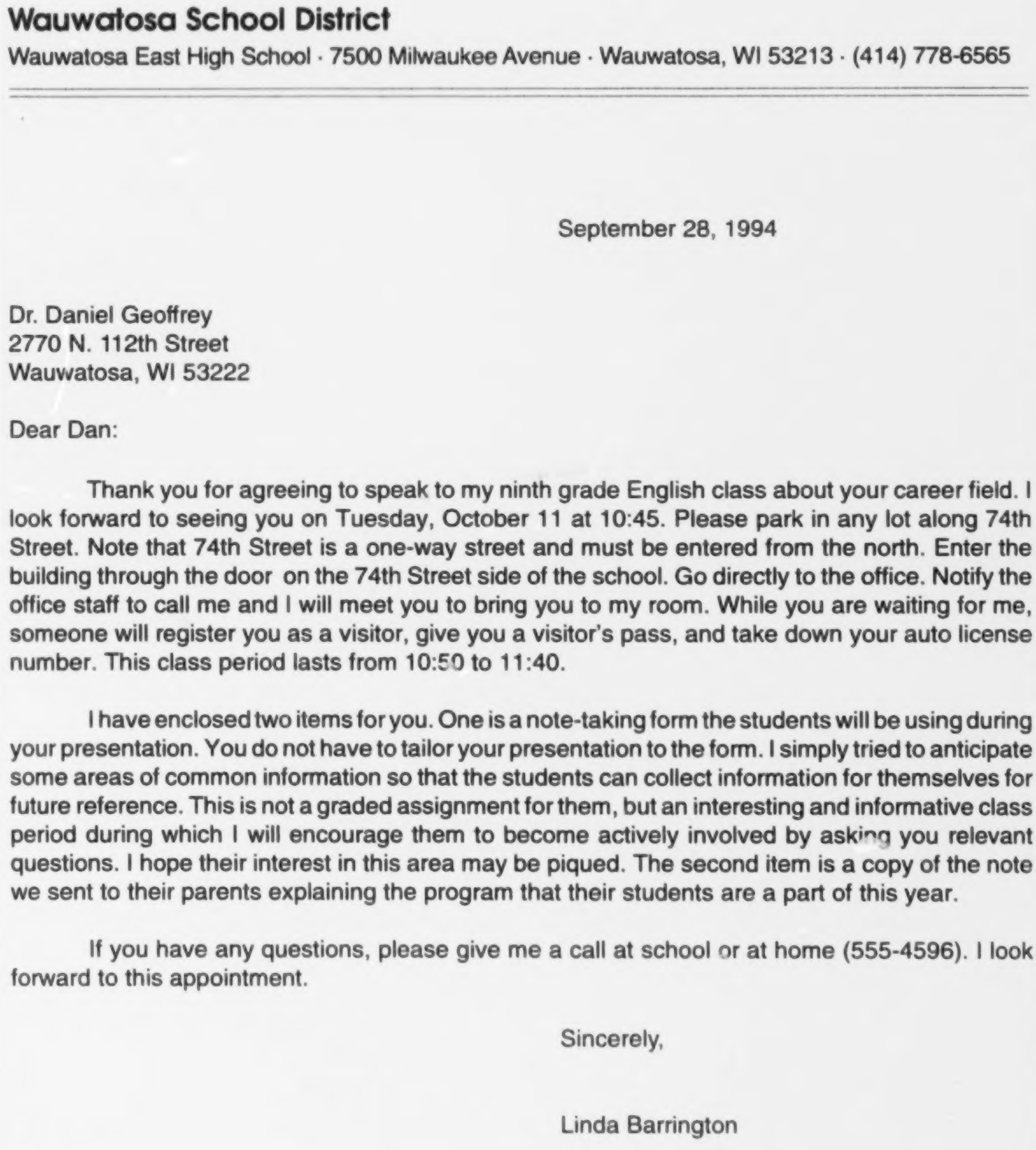
Mr. Fager, technology education instructor, instructed the 30 ninth graders in the construction of the electrophoresis boxes.

Mr. Fager, technology education instructor, instructed the 30 ninth graders in the construction of the electrophoresis boxes which were to be used in the unit on DNA testing in the microbiology class. This was the first contact with a vocational subject area for many of the students. After this activity, several students expressed interest in taking a vocational course

(Text continued on page 220)

▲ *Pariece Wilkins and Kevin Kelly, U.S. Dept. of Education, Office of Vocational and Adult Education, observe a demonstration on the use of an electrophoresis apparatus by Patricia Zelewski, biology teacher.* ▲

Figure 5.4
Informational Letter to Employers



Wauwatosa School District
Wauwatosa East High School · 7500 Milwaukee Avenue · Wauwatosa, WI 53213 · (414) 778-6565

September 28, 1994

Dr. Daniel Geoffrey
2770 N. 112th Street
Wauwatosa, WI 53222

Dear Dan:

Thank you for agreeing to speak to my ninth grade English class about your career field. I look forward to seeing you on Tuesday, October 11 at 10:45. Please park in any lot along 74th Street. Note that 74th Street is a one-way street and must be entered from the north. Enter the building through the door on the 74th Street side of the school. Go directly to the office. Notify the office staff to call me and I will meet you to bring you to my room. While you are waiting for me, someone will register you as a visitor, give you a visitor's pass, and take down your auto license number. This class period lasts from 10:50 to 11:40.

I have enclosed two items for you. One is a note-taking form the students will be using during your presentation. You do not have to tailor your presentation to the form. I simply tried to anticipate some areas of common information so that the students can collect information for themselves for future reference. This is not a graded assignment for them, but an interesting and informative class period during which I will encourage them to become actively involved by asking you relevant questions. I hope their interest in this area may be piqued. The second item is a copy of the note we sent to their parents explaining the program that their students are a part of this year.

If you have any questions, please give me a call at school or at home (555-4596). I look forward to this appointment.

Sincerely,

Linda Barrington

Figure 5.5

Speaker Presentation Form

Speaker's name: ______________________________ Today's date: __________

Occupation/Title: ______________________________

Place of employment: ______________________________

Background/Preparation

Coursework required to prepare for this career of major field of study: ______________________________

____

Related helpful courses in school: ______________________________

Colleges/universities respected in this field: ______________________________

The Career Itself

Job description: ______________________________

____

Responsibilities: ______________________________

____

____

Advantages of this career	Disadvantages of this career

The Future

Places where most job opportunities will most likely be available: ______________________________

Entry level salary range in 1994–95: ______________________________

Other related occupations a person would be prepared for with this background: ______________________________

____

Figure 5.6

Construction of an Electrophoresis Apparatus

Construction

Construction of the following should require access only to a table saw and electric drill. Total cost should be @ $10.00.

Electric Components from Radio Shack

1 pkg. banana plugs	#274-730	$1.69
1 pkg. binding posts	#274-662	$1.59
8" black #18 probe wire		
8" red #18 probe wire		

Hardware Store Materials

1 silicon aquarium sealer tube (Dow Corning Sealant is good)
1 bottle of cyanoacrylate glue (Surehold Plastic Surgery is good)
2 1/2" round head sheet metal screws
Scrap 3/16" plexiglas (sizes of parts follow)

American Science Surplus Materials

1 14V 150 mA DC power supply @$3.25
2 carbon rods @ 1/2" x 5"

Cadillac Plastics Plexiglas Parts List

1	bottom	6" x 9" x 3/16"
1	top	6 and 1/4" x 9 and 3/8" x 3/16"
2	sides	6" x 4" x 3/16"
1	front	9 and 3/8" x 4" x 3/16"
1	back	9 and 3/8" x 4 and 1/4" x 3/16"
2	lips	9 and 3/8" x 1 and 1/2" x 3/16"
2	gel tray bottoms	2 and 7/8" x 3" x 3/16"
4	gel tray sides	1" x 3" x 3/16"
2	combs	2 and 7/8" x 1" and 3/8" x 1/8"
1	inner platform top	3" x 6" x 3/16"
2	platform supports	1 and 1/2" x 6" x 3/16"

Assembly:

Start by dry fitting the parts for the box proper. Bind parts with artists tape. Use capillary action to allow glue to seep into joints. Let sit for 24 hours to assure drying. Silicon seal outside and inside.

Figure 5.6, continued

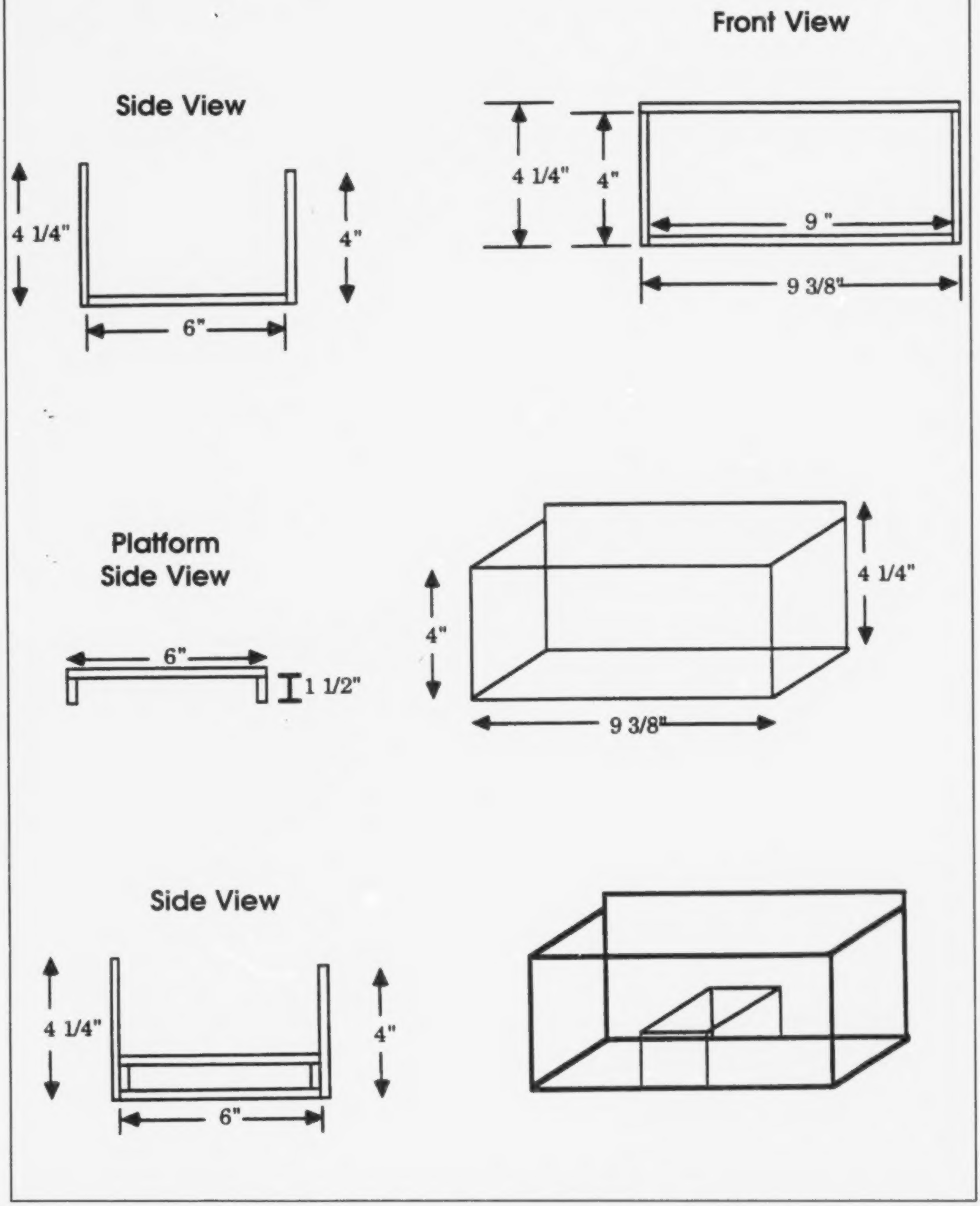
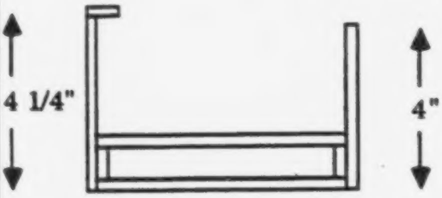
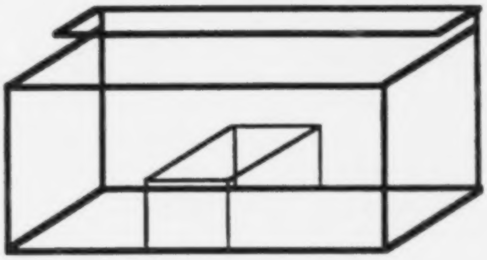

Front View
Side View
4 1/4"
4"
6"
4 1/4"
4"
9 "
9 3/8"
Platform
Side View
6"
1 1/2"
4 1/4"
4"
9 3/8"
Side View
4 1/4"
4"
6"

Figure 5.6, continued

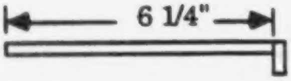
Side View



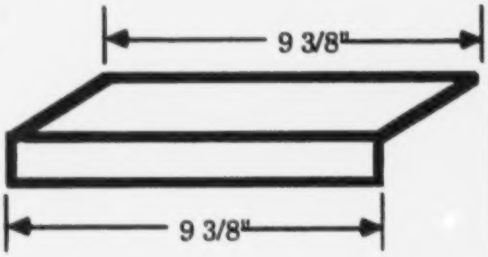
Platform in box and lip on box



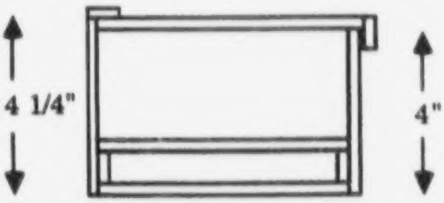
Top Side View

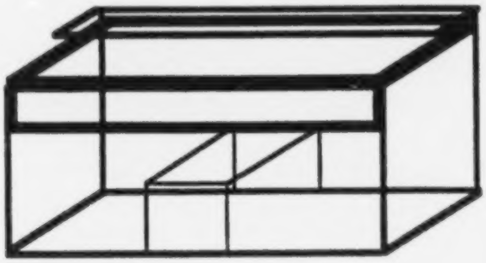


Top



Side View





during the next school year. A list of materials and drawings necessary for the construction of electrophoresis boxes is shown in *Figure 5.6.*

In Mr. Garski's algebra class, students calculated logarithmic growth using the bacteria plate counts calculated in biology. A three to four day session was required to accomplish this task. Mr. Garski integrated algebra successfully with biology in this manner during most days of the third quarter. He stated that "planning during the summer is the only way this kind of integration can be [done], because once school starts there is no time available." Mr. Garski thought that the students really liked the integration tasks, and so did he. He also felt that this kind of activity at the ninth grade level helped students make the sometimes difficult transition from middle school to high school.

Mr. Garski felt that planning during the summer was a primary contributor to the success of this integration project.

Wauwatosa East's business education instructor, Ms. Reed, taught the students basic spreadsheet skills and instructed them in using Lotus 1-2-3 to graph exponential growth. She was also available to students after school, to provide additional help. Ms. Reed thought it was a good idea to learn about what other teachers were doing, and for students and teachers to see the connections between content areas.

▲ *Patricia Zelewski, Project Coordinator and biology instructor, preparing to give a microbiology multimedia computer presentation.* ▲

Since the vocational academic integration was centered around the microbiology class, which Ms. Zelewski teaches, she served as the project manager, coordinating the development of the integrated curriculum, purchasing equipment, and facilitating the VALP team meetings. She also arranged for the coordination and integration of the mathematics, English, technology education, and business education components of the microbiology unit.

Students appeared to enjoy the integrated activities and being able to perform some of the "hands on" work associated with the biology labs, as well as the labs in technology and business education.Through these labs students had an opportunity to apply their knowledge in practical settings.

Addressing Wisconsin Learner Outcomes

Throughout the integration project, each of the seventeen Wisconsin Learner Outcomes were addressed. Below, each of the Wisconsin Learner Outcomes are listed, followed by a brief description of the manner in which they were encountered. This outline clearly shows positive outcomes in all seventeen Learner Outcome areas.

Throughout the integration project, each of the seventeen Wisconsin Learner Outcomes were addressed.

1. **Identify, develop, evaluate, and apply criteria to ideas, products, or performance of one's self or others.**

   Biology: Students brainstormed about the components of a proper presentation. They identified the points that should be covered as well as how they should be delivered.

   Students evaluated themselves and the teacher using performance surveys. On these surveys, students were asked to verbalize what they, as individuals, could do to learn more. They also identified what the teacher could do to help them learn better.

   English: Students studied public speaking and brainstormed criteria for the evaluations in giving a speech.

❑❑❑

2. **Revise a product, performance, system, or idea in response to relevant information.**

   Biology: After they completed *Using Random Sampling,* students discussed how they could change the procedure to reduce their percentage error.

   After discussing *Population Growth Curves,* students talked about reasons why population growth models might not work well in real world situations.

   English: For every composition students wrote, they received much feedback for improvement. They then had the opportunity to use this feedback to revise their essays.

   Algebra: Students had the opportunity to do a written paragraph test correction after each test.

❑❑❑

3. **Make informed decisions by examining alternatives and anticipating consequences of actions.**

Biology: In a Compel presentation, students looked at methods by which diseases are transmitted. After the presentation, the class discussed how diseases can be avoided.

English: Students had to decide whether or not they approved of their performance on every assignment and test. They also had to determine, based upon the consequences, whether or not to redo their work.

Algebra: Students understand that if they choose not to correct the items they missed on a test with a written paragraph test correction, they will keep the grade they originally obtained.

□□□

Students used written instructions and illustrations to complete various lab activities.

4. **Achieve desired results by interpreting and executing instructions, plans, models, and diagrams.**

Biology: Students used written instructions and illustrations to complete the following lab activities: Gram staining, making exposure and contact plates, and inoculating liquid media.

Students interpreted data in *Identifying Unknown Bacteria*.

Students interpreted graphs in *How Ecosystems Change*.

Students gathered and interpreted data in *Using Random Sampling*.

Students interpreted charts and diagrams about cheese making.

English: On the first day of class, students were provided with directions on how to access daily vocabulary lists on the computer. In order to obtain the daily list on subsequent occasions, students continued to apply these instructions.

Students also learned about single source and persuasive composition formats, and then wrote their own papers in these formats.

Algebra: Students read individual sections of the text, take notes during class, and use this information to perform daily assignments.

Business Education: Students interpreted data and made graphs in *A Study in Human Population Growth* (they learned how to use spreadsheets and graphing in Lotus 1-2-3).

□□□

Students recognized that milk inoculated with lactic acid bacteria becomes yogurt.

5. **Recognize and devise systems and describe their interdependence.**

Biology: Students plated bacteria and inoculated broth to see organism growth. They chose the sites from which the samples were taken. Students examined the relationship between their site and amount and type of growth. Students saw that no growth occurred on the control plates because no bacteria were on the swab. Bacteria did grow on the agar and in the broth when they touched it with the swab from the sample site.

Students recognized that milk inoculated with lactic acid bacteria becomes yogurt.

English: Students recognized language (grammar) as a system and understood its impact on other systems (social, political, etc.)

* * *

6. **Create a quality product, process, or performance that will meet a need.**

Biology: Students worked in groups to develop presentations about bacterial diseases, with each group covering a different disease. The class brain stormed and wrote down what information should be included in each presentation. Students shared responsibility for researching and presenting the findings to the rest of the class.

English: Students prepared and presented speeches to share information about the different careers they had researched.

Students prepared and presented speeches to share information about the different careers they had researched.

Algebra: Students learned how to graph exponential growth in order to understand the Biology labs.

Tech Ed: Students made electrophoresis boxes which were used in the Advanced biology class. They learned about how the boxes are used to separate different-sized fragments of DNA.

* * *

7. **Respond to the aesthetic, intellectual, and emotional aspects of an event, performance, or product.**

Biology: Students were amazed that milk turned to yogurt overnight. Students listened attentively as fellow groups gave class presentations.

English: Students were interested learning about guest speakers' careers. They responded intellectually to literature by preparing critical responses and analyzing work for individual purposes.

Algebra: Students were impressed with the speed and ease of TI-81 calculator use.

Students were impressed with the speed and ease of the TI-81 calculators used in algebra class.

Business Ed: Students appreciated the speed and quality of graphs produced in Lotus 1-2-3.

Tech Ed: Students were enthusiastic about building electrophoresis boxes.

* * *

8. **Transfer learning from one context to another.**

Biology/Tech Ed: Students recognized that equipment used in Biology must be manufactured. They saw that making electrophoresis boxes required materials, tools, and a procedure.

Biology/Business Ed: Students found that the spreadsheet and graphing capabilities of Lotus 1-2-3 could help them present biological information faster and neater.

Students heard career speakers repeatedly emphasize the necessity and value of communication skills for careers in science.

English/Biology: Students heard career speakers repeatedly emphasize the necessity and value of communication skills for careers in science.

Algebra/Biology: Students had a better understanding of exponential growth from having encountered bacteria growth in Biology.

* * *

9. **Recognize, define, and solve a problem.**

Biology: Students recognized when their slides did not work. They looked to their procedure to identify the problem correct for it when they made other slides.

English: Students recognized computer problems when writing essays and strategized to solve their problems.

* * *

10. **Recognize and communicate one's strategies for accomplishing objectives.**

Biology: In the Gram stain lab, before the students could try it again, they had to understand what they could have done wrong so that part of the procedure could be done correctly.

English: Before writing major papers, students were required to outline their plans and share them with the teacher in individual conferences.

* * *

Students worked in groups for discussion of short stories and poetry lessons.

11. **Work effectively in groups to accomplish a goal.**

Biology: Students prepared and presented their bacteria report as a group. They did the labs *Using Random Sampling, How and Where Do Bacteria Grow?,* and *Using Bacteria to Make Food* in groups.

English: Students worked in groups for discussion of short stories and poetry lessons.

Algebra: Students worked in groups weekly to complete assignments or in-class work.

* * *

12. Defend a position by integrating information from multiple sources.

Biology: When preparing the biology report, each student was required gather information which would be shared with other group members.

* * *

13. Develop and test a hypothesis.

Biology: For the lab *How and Where Do Bacteria Grow?*, students sampled bacteria from places where they hypothesized (thought) bacteria may be present. They then watched for growth and responded accordingly.

English: Students developed and justified the likelihood of developments within literary works, such as *Romeo and Juliet, To Kill a Mockingbird*, and *The Andromeda Strain*.

Students developed and justified the likelihood of developments within literary works, such as Romeo and Juliet, To Kill a Mockingbird, *and* The Andromeda Strain.

* * *

14. Recognize when a need for specific information exists and demonstrate the ability to locate, evaluate, and focus that information.

Biology: Students used the library to conduct research for their class presentations. They worked in teams and shared information.

English: Students used the Career Resource Center to search for information on their career speech topics.

* * *

15. Conceive of places, times, and conditions different from one's own.

Biology: The students discussed bacterial infection and discussed actual outbreaks occurring in other places. For example, they discussed cholera in Zaire, meningitis in Minnesota, and diphtheria in Russia.

English: To better understand Shakespeare's drama, students studied the Elizabethan period and the people living in that time. They also studied Victorian English to better understand Dickens' *Great Expectations.*

Students used the library to conduct research for their class presentations. They worked in teams and shared information.

* * *

16. Identify compelling personal interests and goals and pursue them.

Biology: Many students showed personal interests related to biology. For example, one student brought in a magazine article on Gulf War Syndrome, and another brought in newspaper articles and taped part of a relevant newscast.

English: The majority of career lessons focused on students' personal interests, abilities, and preferences as they explored career possibilities.

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The majority of career lessons focused on students' personal interests, abilities, and preferences as they explored career possibilities.

17. Recognize the influence of diverse cultural perspectives on human thought and behavior.

English: In the short story unit, students read and discussed selections written by minority authors and about minority people in the United States. They also read separate novels reflecting diverse cultural perspectives and wrote their book reports with part of the focus on those issues. The entire class read *To Kill a Mockingbird*, which included discussion and background of racial discrimination in the South in the 1930s.

Resources

In addition to the biology text, Ms. Zelewski frequently used current news articles to enhance textbooks and to demonstrate the relationship between biology and everyday life. Below, class texts and several articles which were used to complement the class are cited:

The University of Chicago School of Mathematics Project, Glenview, IL: Scott, Foreman and Company. (1990). *Algebra*.

Crichton, M. (1969). *Andromeda Strain*. New York: Centisis Corporation, Ballantine Books.

Johnson, G. B. (1994). *Biology: Visualizing Life*. Orlando, FL: Holt, Rinehart, Winston, Inc.

McConnaughey, J. (1994, March 4). Leprosy leaves old fears, ignorance behind. *Milwaukee Journal*.

Journal wire reports. Growing peril: Flesh-poisoning strep makes a comeback in US. *Milwaukee Journal*.

Ms. Zelewski frequently used current news articles to enhance textbooks and to demonstrate the relationship between biology and everyday life.

Associated Press. (1994, September). Thousands flee bubonic plague outbreak in India. *Milwaukee Journal*.

Resler, J. (1994, March 1). Maybe this is what's bugging you: Tiny bacteria may be main villain in ulcers. *Milwaukee Sentinel*.

Hauser, J. T. (1993, Spring). Don't Spoil Your Supper. *Carolina Tips*, Burlington, NC: Carolina Biological Supply Company.

Sausage to be tested for strain of E-coli. (1995, January 26). *Milwaukee Journal*.

Serving Special Populations

Project team members took a pro-active approach in order to determine the needs of special populations students. Progress was also carefully monitored throughout the project, with any necessary modifications being made on an individualized basis.

Assistance Strategies

Accommodations were made to maximize student success, and some were provided as options to all students. Below, techniques used during the integration project are listed.

Extra Help

At Wauwatosa East, school ends at 3:00 p.m. for students and 3:30 p.m. for the teachers. The extra half hour is for student help. Most teachers stay beyond this time regularly to help students, and many teachers come into school early to help students, as well. A cooperative study period, also referred to as a CSP, is when students in study hall may access teachers who are free to provide extra help.

Planned Study Sessions

For a selected group of slow learners, which included students with learning disabilities, mandatory study sessions were used in Biology and Algebra. Ms. MacDonald also provided extra help after school for special education students. Some students were more conscientious about attending the mandatory study sessions and accessing after school assistance. In fact, after school help was only utilized about 10% of the time, and some special education students opted not to use after school help at all.

Project team members took a pro-active approach in order to determine the needs of special populations students.

Extra Credit Opportunities

Ms. Zelewski provided blank flash cards and the opportunity to get extra credit for making them. Other extra credit opportunities were available in the biology class at various times, for students who wished to gain extra credit points.

Preferential Seating

To enhance the performance of students with learning disabilities and hearing difficulties, preferential seating was used. In biology and math classes, students with learning disabilities were encouraged to sit in the front of the classroom to maximize attention, while the student with a hearing impairment sat in the front of all classrooms to ensure being able to see the teacher.

Tutors

Tutors were available through the National Honor Society, and although recommended for the special education students, they did not take the opportunity to utilize them. One of the special education students did have a tutor outside of the school, and Ms. Zelewski provided an extra lab manual to be used in the tutoring sessions.

Individual In-Class Help

Ms. Zelewski designed the Gram-staining lab so that each student would be able to make and stain their own slide. Although she was available to provide assistance, one of the special education students was very apprehensive. Another student volunteered to help out by showing the procedure again; this suggestion seemed to help ease the student's apprehension, so Ms. Zelewski allowed the volunteer to demonstrate the procedure again.

Cooperative Group Work

Opportunities were provided for students to work individually, in pairs, in groups, and as a whole class. When forming groups in Biology, Ms. Zelewski placed students with special needs in lab groups with others who would be cooperative and willing to provide assistance as necessary.

When forming groups in Biology, Ms. Zelewski placed students with special needs in lab groups with others who would be cooperative and willing to provide assistance as necessary.

Variety Of Instructional Strategies and Modalities

As mentioned above, students in biology and algebra did work individually, in small groups, and as a whole class (brainstorming). In Biology the students were exposed to various instruction modalities including the white board, chalkboard, overhead, slide projector, scope cam, and television (Compel presentation, videos and scope cam display). They heard lectures and participated in discussions. Students had access to their up-to-date grades at any time after school. Weekly assignments for the week were posted on the board. Mr. Garski made use of chalkboard, overhead, class discussion, lecture, TI-81 calculators, and the computer lab to teach the algebra class.

In English, students also worked individually, in small groups, and as a whole class (for discussion and brainstorming). Mrs. Barrington used a combination of overhead notes, chalkboard notes, and/or printed handouts to provide visual learning modes in addition to the auditory. Teaching processes included lecture, discussion, question and answer, small-group, and partner work. When appropriate the class used filmstrips, videos and computer word processing. All assignments were written on the chalkboard. Grades were updated and posted on a daily basis. Students had the opportunity to redo any assignment, quiz, or test they were unsatisfied with. Students received assessment rubrics in advance of writing assignment to increase opportunities for success.

Pre-Organized Information

In Biology, students were given the schedule for the week on the chalkboard. Assignments for the entire year were given on the first day of class. This allowed students to work at their own pace, with advance knowledge of deadlines.

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Special Testing Procedures

In Math class, one of the special education students was given one-on-one testing by Mr. Garski and/or Ms. MacDonald. Students were also given the opportunity to do test corrections to earn extra points. Despite low test scores, not all of the special education students took advantage of this opportunity.

Other Modifications

In addition to preferential seating, other accommodations were made for a hearing impaired student, including a "partner" who was seated in the next seat and could provide details which may be missed during classroom presentations. Also, the biology teacher provided transcripts for slide presentations, and turned a light on her face, which allowed for lip reading, when showing Compel presentations. In English class, the teacher made photocopies of filmstrip narration, so she could read the text while the filmstrip was being shown. Additionally, each special education teacher is assigned two classes for which he/she must take notes and provide help for all students. Suggestions for maximizing success are given to students and teachers on an ongoing basis. To keep parents apprised of student performance, progress reports are sent to parents three times per quarter.

Additionally, each special education teacher is assigned two classes for which he/she must take notes and provide help for all students.

Individualized Education Plans

Joyce Larson and Sherry MacDonald, special education teachers, wrote up the IEPs for each special needs student. These plans were given to the classroom teachers at the beginning of the school year with an additional form communicating the student's relative strengths and weaknesses. The plans can change as often as the special education teacher feels is necessary, and they do change at least once a year. No specific changes were necessary as a result of involvement in the Biotechnology Integration Project. An example of an IEP can be seen in *Figure 5.7*.

Teaching Students with Hearing Impairments

Ms. Larson, teacher for hearing impaired students at Wauwatosa East High School, provided additional information to teachers who would be working with hearing impaired students, including a note (shown below) to explain the extent and impact of the student's hearing loss. Ms. Larson provides additional information to teachers to assist them in meeting the needs of students with hearing impairments, including a plot of the student's hearing loss in relation to everyday sounds and a handout which includes a list of helpful hints on teaching students who are deaf or hard of hearing. The list of helpful hints is shown in *Figure 5.8*. Throughout the school year, Ms. Larson sends short notes to teachers to outline what she is providing assistance with and to let teachers know that she is available to provide assistance as necessary.

The following is the shell of the memo used by Ms. Larson to communicate with regular education teachers. As with any memo, the date, the person being addressed, the person writing, and the subject of the memo would appear at the top. The identity of the student has been changed.

Mike will be a ninth grader at East High School this year. He has a severe, bilateral, sensorineural hearing loss. Mike wears hearing aids in both ears. His hearing aids will amplify all sounds in the environment, but won't make them as clear as you and I hear them.

Attached you will find information regarding hearing impairment and classroom suggestions that will be of benefit to you and Mike. One special area of difficulty for Mike is with new vocabulary and understanding words and expressions that he has not encountered before. It would be helpful if you are aware of that and give a little further explanation to the whole class without singling out Mike. There is also a speech/sound chart on which Mike's hearing loss is plotted. The quieter sounds are towards the top and the low sounds are towards the left. The chart indicates that Mike should be able to hear most sounds with his hearing aids except a, v, pl, k, f, s, and th.

Mike will have an hour open for Speech/Language lessons (once a month)

Throughout the school year, Ms. Larson sends short notes to teachers to outline what she is providing assistance with and to let teachers know that she is available to provide assistance as necessary.

(Text continued on page 234)

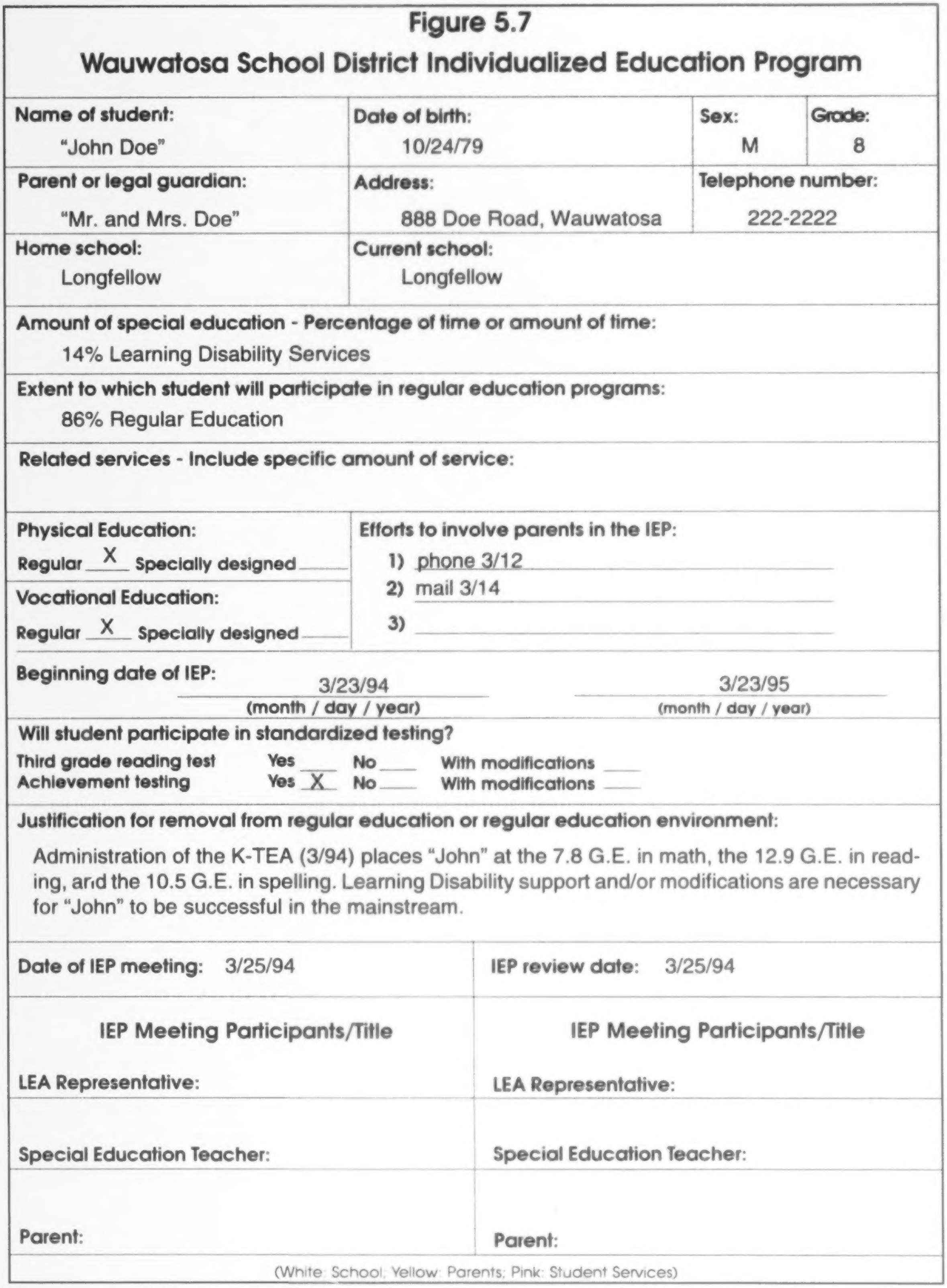


Figure 5.7

Wauwatosa School District Individualized Education Program

Name of student: "John Doe"	**Date of birth:** 10/24/79	**Sex:** M	**Grade:** 8
Parent or legal guardian: "Mr. and Mrs. Doe"	**Address:** 888 Doe Road, Wauwatosa	**Telephone number:** 222-2222	
Home school: Longfellow	**Current school:** Longfellow		

Amount of special education - Percentage of time or amount of time:
14% Learning Disability Services

Extent to which student will participate in regular education programs:
86% Regular Education

Related services - Include specific amount of service:

Physical Education:
Regular X **Specially designed** ___

Vocational Education:
Regular X **Specially designed** ___

Efforts to involve parents in the IEP:
1) phone 3/12
2) mail 3/14
3) ___

Beginning date of IEP: 3/23/94 **(month / day / year)** 3/23/95 **(month / day / year)**

Will student participate in standardized testing?

Third grade reading test	**Yes** ___	**No** ___	**With modifications** ___
Achievement testing	**Yes** X	**No** ___	**With modifications** ___

Justification for removal from regular education or regular education environment:

Administration of the K-TEA (3/94) places "John" at the 7.8 G.E. in math, the 12.9 G.E. in reading, and the 10.5 G.E. in spelling. Learning Disability support and/or modifications are necessary for "John" to be successful in the mainstream.

Date of IEP meeting: 3/25/94
IEP review date: 3/25/94

IEP Meeting Participants/Title	**IEP Meeting Participants/Title**
LEA Representative:	**LEA Representative:**
Special Education Teacher:	**Special Education Teacher:**
Parent:	**Parent:**

(White: School; Yellow: Parents; Pink: Student Services)

Figure 5.7, continued
Wauwatosa School District
Individualized Education Program

Name of student:
"John Doe"

Present levels of educational performance:
Administration of the K-TEA (3/94) places "John" at the 7.8 G.E. in math, the 12.9 G.E. in reading, and the 10.5 G.E. in spelling. He is mainstreamed for all classes except math.

Annual goal:
"John" will be mainstreamed for his 9th grade regular education classes as long as success can be anticipated.

Short-term Objectives	Evaluation		
	Objective Criteria	Procedures	Schedule
"John" will: • maintain assignment notebook for all academic classes	100%	Complete before leaving each class	daily
• independently seek help from Reg. Ed. and/or L.D. teachers as needed	100%	teacher observation & conferencing	on-going
• will communicate concerns about assignments, quizzes, and tests appropriately and in a timely fashion with the instructor (self-advocate)	90%	teacher observation & conferencing	on-going
• will complete and hand in all assignments on time	100%		
• will attend school 90% of the time			

Specific special education and related services that will contribute to meeting this goal:

L.D. teacher and Regular Education teachers

Action taken on this goal at IEP review: **Date:**

Figure 5.8
Teaching Students Who Are Deaf or Hard of Hearing
Hints for the Classroom

Classroom Organization

- **Seat your students who are deaf or hard of hearing where they can see the teacher** and the blackboard, and still turn to see other students. Allow the student to change his/her seat if you teach some subjects from different places in the room.

- **Avoid positioning yourself in front of a bright light or a window.** A neutral background enhances the student who is deaf or hard of hearing's ability to lip-read.

- **Be sure students who are deaf or hard of hearing are seated near enough to speech-read you.**

Visual Aids

- **Use of the blackboard:**
  - Cue students who are deaf or hard of hearing to page numbers in the textbook by writing them on the blackboard.
  - Use overhead or blackboard to draw attention to key points during the class.
  - Use an outline on the blackboard to help your students follow the presentation.
  - Write homework assignments on the blackboard.

Note: Avoid talking while writing on the blackboard unless there is an interpreter present.

- **When using a video, movie, filmstrip, overhead, etc.,** remember that students who are deaf or hard of hearing can't speech-read the person talking or hear the audio. It would also be helpful to provide the student with a script or a written summary in advance.

- **Provide handouts on key points.**

- **Share your own notes with your students.**

- **Provide note taking during class and tutoring after class,** as the student who is deaf or hard of hearing cannot watch the teacher and take notes simultaneously. The student who is deaf or hard of hearing should have access to the notes of a trained note taker or a good student in the class (use carbon paper or photocopy notes).

Classroom Communication

- **Talk slowly and clearly to your students who are deaf or hard of hearing.** Do not exaggerate mouth movements or shout.

- **Have one person talk at a time,** so the student can follow the discussions.

Figure 5.8, continued

Teaching Students Who Are Deaf or Hard of Hearing

Hints for the Classroom

- **Identify the person speaking** and make sure that students who are deaf or hard of hearing know who is talking. Pointing toward the person speaking is helpful, especially if no interpreter is present.
- **Avoid covering your mouth when speaking.**

Note: When using visual media, give your students time to read the screen before you start talking.

Instructional Techniques

- **Use hands-on experience activities as much as possible.** This is generally beneficial to hearing students as well.
- **Remember, students who are deaf or hard of hearing can't watch and write at the same time.** If the student is writing, wait until he/she looks up to continue instruction.
- **Avoid moving around the classroom excessively.**
- **Do not assume that the student who is deaf or hard of hearing has understood everything** that you have carefully explained, even if he/she nods and acknowledges understanding. Ask the student to explain the point you made to make sure that your message was received properly.
- **Help develop self-esteem by studying prominent deaf people** when reading biographies. Study hearing aids/FM systems in science, etc.

Conclusion

Students who are deaf or hard of hearing will find that during their lifetimes, fair or not, they will have to do more work to get all the information—whether it is copying someone else's notes, checking or comparing notes to be sure they didn't miss anything, reading a script ahead of time, or rereading something that was read aloud or discussed orally in class. Initially we may have to encourage and promote these kinds of study habits until the students fully understand their responsibilities. Eventually, students must accept these responsibilities as their own.

and for meetings with me, the teacher of the hearing impaired (daily), to work on his assignments. Speech/Language staff will be available to help you to help Mike succeed in the mainstream. I'd appreciate hearing from you as to where help is needed. We'll need to keep in touch. Thank you for all your help.

Two weeks later Ms. Larson sends a follow-up memo. As shown below:

Well, how have the first two weeks gone for you? It has been a rush for me, but we are managing. I am able to work with Mike for about 30 minutes during the 7th hour in the library. He appears to be keeping up with everything. We've worked on mainly algebra and biology. It is convenient to work with him last hour. He has a little time to work alone and can then tell me where he needs help. If you ever have any questions or concerns, don't hesitate to drop me a note. I do have a mailbox here at East. It is across from the safe (orange door), in the office, on the bottom row. Thanks for your assistance.

This method worked well to keep the lines of communication open between regular education instructors, the hearing impaired teacher, and the student. The information provided by Ms. Larson also helps teachers have a better understanding of student needs before they have difficulty.

Ms. Larson also helps teachers have a better understanding of student needs before they have difficulty.

Results

As a result of the Biotechnology Integration Project, the VALP team hoped to increase the students' knowledge, skills, and interests in microbiology; expose students to technology through constructing electrophoresis boxes; allow students to demonstrate the ability to use proper safety procedures and reference materials; increase student knowledge and application of algebraic concepts; and to observe whether or not special needs students improved performance in the integrated setting. A Program Evaluation Plan was developed to provide direction in the evaluation of these anticipated outcome areas and is shown in *Figure 5.9*. This plan identified evaluation questions, data/information to be collected, data sources, and comparison standards which would be considered when evaluating the outcomes of the project.

Various methods were used to evaluate each of these areas and included pre- and post-test results, grade books, checklists, student and teacher observations and student journals. In addition to forging a path for the integration of vocational and academic education, this project will be instrumental in the Biotechnology Youth Apprenticeship Program, which Wauwatosa plans to implement in the 1996–1997 school year. Another anticipated outcome of this project was to rally support for this type of endeavor.

Identification of the Control Groups

For the sake of comparison, the integrated group (the second hour biology class) was compared with the other biology classes (first and third hour classes) which did not integrate vocational and academic education. These control groups were heterogeneous groups, having in common the same

Figure 5.9
Program Evaluation Plan, Biotechnology Integration Project

Evaluation Questions (Claims or Outcomes)	**Data/Information to Be Collected (Claim Categories or Indicators)**	**Data Sources**	**Instruments, Methods & Procedures (Comparison Standards)**
Do the students have increased knowledge and skills in microbiology? (summative)	Achievement and semester grades for pilot group versus control group (in Biology)	Students	Pre- and post-test results, gradebook
Were the students able to successfully build the electrophoresis boxes?	Electrophoresis boxes	Teacher / product	Checklist
Do the students demonstrate proper safety procedures?	Observation of student performance	Student, observation, written evaluation	Video, checklist
Do students utilize reference material for biotechnology terminology in reading *The Andromeda Strain*?	Collection of terms organized by the students	Observation (use of dictionary), completion of glossy (product / student)	Creation of glossary on spreadsheet, essay test
Were students in the pilot class more interested in pursuing careers in the biotechnology field?	Pose questions to students, career interests	Students	Strong Campbell Career Interest Inventory
Do the students have increased knowledge of the algebraic concepts integrated in the pilot?	Observation, achievement, and semester grades for pilot group versus control group (in Algebra)	Students	Gradebook, tests
Were special needs students in the pilot program able to show increased achievement over special needs students in the control group?	Unit grades	Grades	Testing and observation
Did students show an increased interest in topics during the unit?	Personal opinions	Students, journals	Journal

biology teacher and most of the same curriculum. The exception in the curriculum was the integration components.

When comparing the final grades of the integrated group with the final grades of the two control groups, the students in the integrated group had a mean score of 79.24% while the other groups had means scores of 74.22% and 78.96%, for first and third hour classes, respectively. In the integrated group, 60% of the students scored above 80%, while the number of students scoring above 80% was 30% in the first hour class and 40% in the third hour class. For additional information on final grades, see *Figure 5.10.*

To evaluate student knowledge and interests in microbiology, a number of questionnaires and surveys were given, including those shown in *Figure 5.11 and Figure 5.12.* Overall results showed that the integrated group more often felt that they had learned "a lot" about microbiology, whereas the control groups had more responses in the "a little" category. Both groups had approximately the same number of students respond that they had learned "quite a bit." Students in the integrated group frequently cited that making the electrophoresis boxes was one of the activities they most enjoyed.

Based upon reactions from the students and the teachers, the Biotechnology Integration Project was quite successful in its first year.

Summary

Students enjoyed being able to work with the specialized equipment, learning about a wide range of biology professions, and working with the computers. They also realized how much there is to know about biology and realized that it is a difficult subject to learn and to teach. There were also a number of positive comments regarding the opportunity to incorporate the vocational subjects (technology and business education) with the academic areas (biology, English, and algebra). As a result of the Biotechnology Integration Project, students were able to see and experience the relationships between the different subjects.

Evidence Of Administrative and Community Support

Administrators and community members were very supportive of the Biotechnology Integration Project. For example, Mr. Scott Kellogg, Director of Curriculum and Instruction, provided additional funding for some of the project's needs. Mr. John Hays, Principal, was a guiding force in obtaining computers and technology for use in the integration project. Without computers, the students would not have been able to accomplish as much as they did. Another supportive individual was Mr. Andrew Williams who works in the Electronics Lab at the Veterans Administration Hospital in Milwaukee. Mr. Williams volunteered his time and the supplies to build a prototype of the electrophoresis box, which was later used as a model when students constructed their own boxes. The electrophoresis boxes cost approximately $200 if they are purchased.

Many local business persons graciously agreed to take the time to talk with students about their careers and what it takes to be successful. Students responded positively to this interaction and seemed to enjoy learning from the members of the community. There was a great deal of support for the project from administration, faculty, staff, and the community. Having such support is often a major factor in the success of a new program. Based upon reactions from the students and the teachers, the Biotechnology Integration Project was quite successful in its first year.

(Text continued on page 240)

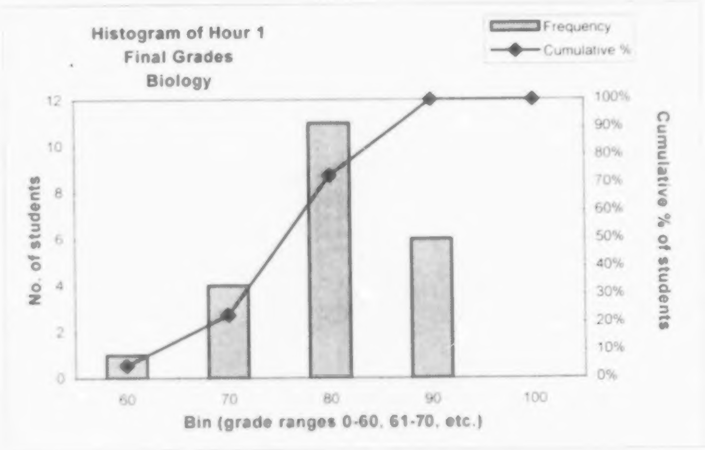
Figure 5.10
Final Biology Grades

Hour 1

Bin	*Frequency*	*Cumulative %*
60	1	4.55%
70	4	22.73%
80	11	72.73%
90	6	100.00%
100	0	100.00%

Mean Score: 74.22%

Note: 70% of the students scored less than 80%, with 30% scoring above 80%.

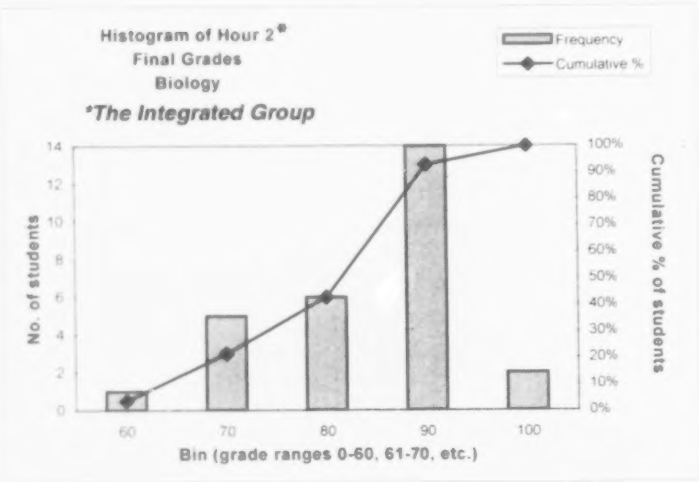


Hour 2

Bin	*Frequency*	*Cumulative %*
60	1	3.57%
70	5	21.43%
80	6	42.86%
90	14	92.86%
100	2	100.00%

Mean Score: 79.24%

Note: 40% of the students scored less than 80%, with 60% scoring above 80%.



Hour 3

Bin	*Frequency*	*Cumulative %*
60	1	4.76%
70	4	23.81%
80	7	57.14%
90	6	85.71%
100	3	100.00%

Mean Score: 78.96%

Note: 60% of the students scored less than 80%, with 40% scoring above 80%.

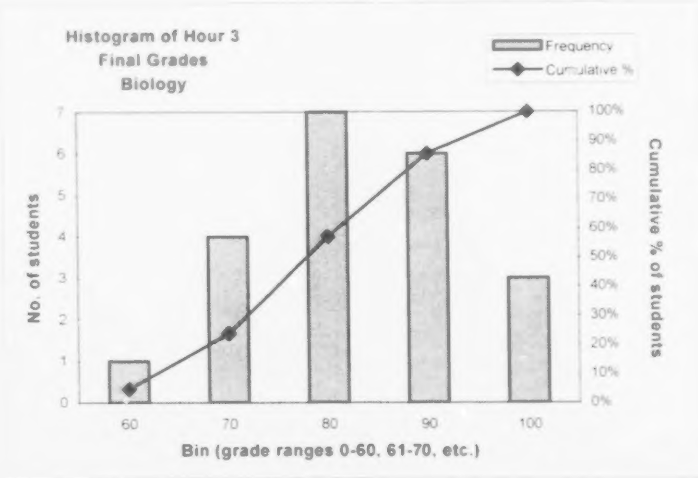


Figure 5.11

Student Mid-Term Class Evaluation Form

Name: ______________________________ **Class hour:** ________

1. How much of what we are learning in class do you think you are understanding? Circle one.

   All of it **Most of it** **Some of it** **Very little of it** **None of it**

2. Are you working as hard in Biology class as you possibly can? **Yes** **No**

3. What can **you** do to help yourself better understand the material covered in class?

4. What can **I** do to help you better understand the material covered in class?

5. What grade do you think **you** deserve in this class **right now**. Circle one.

   A **A-** **B+** **B** **B-** **C+** **C** **C-** **D+** **F**

6. Why do you think that **you** deserve the grade that you circled?

7. What grade do you think **I** deserve for the way I teach the class. Circle one.

   A **A-** **B+** **B** **B-** **C+** **C** **C-** **D+** **F**

8. Why do you think that **I** deserve the grade that you circled?

Figure 5.12

Student Final Class Evaluation Form

Name: ______________________________ **Class hour:** ________

1. Before the microbiology unit, circle the word describing how much you felt you knew about microbiology.

   A lot **Quite a bit** **A little** **Very little** **Not much** **Nothing**

2. As a result of the Microbiology unit, circle the word describing how much you feel you know about microbiology.

   A lot **Quite a bit** **A little** **Very little** **Not much** **Nothing**

3. Describe the five things you most remember about microbiology.

   a.

   b.

   c.

   d.

   e.

4. Describe the five things you most enjoyed in the microbiology unit.

   a.

   b.

   c.

   d.

   e.

5. Do you think you would enjoy a career using microbiology? Why or why not?

Postsecondary Articulation Agreements

The science departments at the Wauwatosa high schools are restructuring all of their curriculum. As a result of the restructuring, there will be no biology at the high schools next year (1995–1996). Biology curriculum is being rewritten and will resume in the 1996–1997 school year. The school's School-to-Work Coordinator, Pam McGuire, continues to work toward the development of formal articulation agreements with local technical colleges. With the implementation of the Health and Human Services Youth Apprenticeship and the upcoming Biotechnology Youth Apprenticeship, it is expected that progress will continue in this area.

▲ *Biotechnology Integration Project students with visitors from the U.S. Department of Education. Left to right (front rows) Wylie Hefti, Tim Kueht, Lizzy Serflek, Michael Winters; (back row) Kevin Kelly, Sara Gruebling, and Pariece Wilkins.* ▲

Recommendations for Replication

In addition to the students, the VALP team also learned a great deal as a result of the Biotechnology Integration Project. As a result of their experience with this integration project, the following suggestions are made to other schools who may want to replicate this kind of project:

- Don't try to do too much. There is always less time than you think there is. Be sure to dedicate enough time for preparation and practice. In biology, extra time was necessary for preparing media and glassware for labs and for practicing the gel electrophoresis.

- Give short quizzes often. Frequent quizzes will assist students in keeping up with the vocabulary. The vocabulary can be overwhelming once the students get behind.
- Explain the project in more detail to parents, so that they will understand what their son or daughter is involved in. An increase in understanding may also lead to an increase in support for future endeavors.

Staff Development for Integration

6

Developed by Center on Education & Work Staff
Compiled by Lloyd W. Tindall, Center on Education and Work

Staff Development For VALP Teams

The issue of staff development faces every administrator and program planner who sets out to develop any type of project. This is also true when there is a desire to plan and implement an integrated vocational academic program. This chapter describes the staff development program that was developed for the Vocational Academic Learning Program (VALP) teams participating in the Center on Education and Work's project on integrating vocational and academic education.

Identifying VALP team members who can work together and who have students in common can be a difficult challenge. There are many factors which need to be considered when determining who the VALP team members will be and what specific role each individual will play throughout the integration process. Members of the VALP team may know each other by face or name, but often they have had limited opportunities to collaborate or develop solid working relationships. Additionally, the person initiating the idea to integrate vocational and academic education may or may not end up a member of the VALP team. This creates a need for other staff members to be involved and committed to an idea someone else generated. It is critical that all VALP team members have a clear, united understanding of their project's design, intent, and projected accomplishments.

There are many factors which need to be considered when determining who the VALP team members will be and what specific role each will play throughout the integration process.

Project participants were provided with a manual to be used during the week-long training session held at the University of Wisconsin-Madison. This manual included information to guide the planning process and included a section focusing on the aspects of team development. The manual included guidelines and working materials which could be used during the scheduled work sessions. Work sessions were blocks of time (1-2 hours) which were set aside for group work and discussions. Having work time intermingled with presentations helped to break up the day and allowed the teams to use the information which was being presented to them. Below, the guidelines for "Developing Your VALP Team" as they were shown in the participant manual are detailed.

It is critical that all VALP team members have a clear, united understanding of their project's design, intent, and projected accomplishments.

Developing Your VALP Team

Introduction: The tasks outlined below will help each VALP team to identify members' roles and responsibilities which will help to promote the attainment of the project goals and objectives.

1. **Have each VALP team member write a brief summary outlining his/her understanding of their project's design, content, and projected accomplishments.** (See *Figure 6.1, Developing a Project Mission Statement.*)

A. As a group, review each member's ideas.

B. With team consensus create a summary that could serve as a mission statement for the project.

C. As a team, determine what boundaries or limitations there are, including limits of time and money. Discuss ways to work effectively within these limits. (See *Figure 6.2, Getting on the Same Page.*)

D. Are administrative or structure/reform changes needed?

E. Address the need for "Plan B" (an alternative) if it should be necessary.

2. **Identification and definition of VALP Team members roles.**

A. Identify how group leadership will be structured. Select a group leader or co-leaders. (See *Figure 6.3, Discussion of Expectations.*)

B. Team members discuss the expectations they have of their co-members and what they expect of the contact person and group leader.

C. Group leader expresses what he/she expects of team members and how he/she will communicate work loads, etc.

D. As a group define each team member's role and responsibilities during the entire project. Include all areas of involvement (e.g., curriculum writing, implementation, data collection, coordination of video, primary contact with CEW). (See *Figure 6.4, Identifying and Defining Roles of the VALP Team Members.*)

E. Discuss possible time and energy commitments of each team member throughout the process. Come to a mutual agreement on tentative time commitment/level of effort for each member.

F. Develop a structured plan to formalize regularly scheduled and documented meetings of the VALP team. Include involvement during the school year and throughout the implementation phase. Identify a recorder for the meetings who will send copies of meeting minutes to CEW staff. (See *Figure 6.5, Coming Together and Staying Together.*)

G. Brainstorm ideas for coordination strategies to reinforce VALP team working relationships and "pulling together" (e.g., breakfast meeting, Friday afternoon club).

H. Specify a process to address and resolve disagreements.

In an effort to bring members of the VALP team together, teams were asked to come to an agreement regarding their project's mission.

In an effort to bring members of the VALP team together, teams were asked to come to an agreement regarding their project's mission. This is extremely important in the initial phases of process development. Not only is this one of the most important issues in the early stages of program development, it can also be one of the most difficult. Often, turf issues or interpersonal conflicts may need to be resolved before the project can move forward. It can take several work sessions or days for a team to develop. Another essential factor in the development of a VALP team is commitment. To avoid overloading one staff member, all team members must be committed to the project and its success. The necessary level of commitment can be obtained and maintained if each team member has a clear understanding of his/her role and responsibilities.

(Text continued on page 250)

Figure 6.1

Developing a Project Mission Statement

My summary of our project is: ____________________

____

____

____

____

____

Getting on the same page...

Project Mission Statement

Figure 6.2
Getting on the Same Page

Possible Boundaries & Limitations	Ways to Work Effectively

What changes, if any, in scheduling, work assignments, or other areas might be necessary?

____

____

____

If any of the above changes are necessary, how will the need for such changes be addressed, and by whom? ____

____

____

____

If a "Plan B" option (change project design or goals) should become necessary, outline how this will be done. ____

____

____

____

Figure 6.3

Discussion of Expectations

School ____

Contact Person ____________________________________ Phone # ______________

Group Leader _____________________________________ Phone # ______________

Group Leader _____________________________________ Phone # ______________

"Great Expectations"

What I expect ...	What others expect ...
Of Group Leader	*Of Group Leader*
Of Contact Person	*Of Contact Person*
Of Co-Members	*Of Co-Members*

Figure 6.4

Identifying and Defining Roles of the VALP Team Members

School ______________________________

Name	Role	Responsibilities	Time Commitment / Level of Effort

Figure 6.5

Coming Together & Staying Together

How often will the VALP team meet?

Who will record and send meeting minutes to CEW staff?

Reinforcing the VALP Team: Brainstorming

How will disagreements be addressed and resolved?

VALP team members found the above exercises difficult; however, they felt that they were extremely valuable in the development of their teams. CEW staff were available to offer guidance, suggestions, and support during each of the work sessions. In addition to the working materials shown in *Figures 6.1–6.5*, handouts discussing *Tips for Successful Brainstorming, Signs of a Productive Team, Strategies for Team Blockers, and Assumptions About Change* were also included. (See *Figures 6.6–6.9*)

CEW staff were available to offer guidance, suggestions, and support during each of the work sessions.

After the VALP teams spent some time working together to develop a better understanding of their project and their fellow team members, it was time to develop a plan of action. The purpose of this plan was to assist the teams in organizing and developing the integrated curricula. Again, informational and working materials were provided in the training manual, and included the following guidelines for creating an action plan.

Developing Your Plan Of Action

Introduction: The tasks outlined below will help the VALP teams to organize the integration process, and develop information which will be useful in the replication of future projects.

1. **Develop Action Plans.** *Note: Be prepared, this will take several sessions.*
   - A. Using the goals, objectives and project design as outline in your proposal, identify actions that need to be taken. (See *Figure 6.10, Developing Integrated Vocational and Academic Learning Programs. Action Plan.*)
   - B. Delineate tasks, person(s) responsible, expected completion date, resources needed, videotape plans.
   - C. Develop Action Plans for students with special needs. Identify any adaptations or changes which may need to be made. (See *Figure 6.11, Curricular Adaptation Planning Form.*) The *Checklist for Materials*, shown in *Figure 6.12* may be helpful in identifying possible considerations.
   - D. Begin to develop, in detail the methods for integrating the curricula. (See Figure *6.13, Curricula Integration Outline.*) The handout, "*Questions to Ask About Curricula Integration*," shown in *Figure 6.14* may be useful at this point.
   - E. Identify which of the Wisconsin Learner Outcomes are addressed.
   - F. Refer to the "VALP Team Final Products" List to determine if all final products are addressed in the Action Plan. (See *Figure 6.16.*)

The purpose of this plan was to assist the teams in organizing and developing the integrated curricula.

2. **Develop a plan of orientation for school staff, participants, community members and parents, if applicable.**
3. **Develop a plan for Evaluation Design.** (See *Figure 6.15, Planning Your Program Evaluation.*)
   - A. Determine evaluation claims and outcomes.
   - B. Select a control or comparison group and an alternative group, just in case.
   - C. Determine sources, methods, and procedures of data collection; who will collect it; and when.

(Text continued on page 264)

Figure 6.6
Tips for Successful Brainstorming

Things to Keep in Mind

1. Discourage the judgement of ideas. No criticism allowed.
2. Encourage diversity and freewheeling of ideas.
3. Welcome a quantity of ideas.
4. Encourage building on other's ideas (Tailgating).

Brainstorming Techniques

1. Groups of 5 to 10 people are best. (If necessary, divide into smaller groups to all everyone to participate. To create more diverse groups, count off before dividing into groups.)
2. Give advance notification about what will be brainstormed.
3. Limit sessions to one hour.
4. No criticism is allowed during the freewheeling thinking stage. After all possible options have been explored, then the group can further evaluate the ideas.

Brainstorming Steps

1. Develop a problem statement.
2. Give background statements.
3. Encourage ideas in a freewheeling style.
4. Record all contributions.
5. Evaluate ideas.
6. Select the best idea(s) as the problem solution.

Adapted from: Panagos, B., & Watkins, C. (1994, December). *Team Building: Great Expectations*. Presented at the American Vocational Association Annual Conference, Dallas, TX.

Figure 6.7

Signs of a Productive Team

Members listen.

They
- Work at understanding what others are saying.
- Ask others to repeat and clarify.
- Paraphrase.
- Ask if heard correctly.

Members make sure things are said clearly.

They
- Elaborate.
- Give illustrations.
- Ask listeners to paraphrase.
- Repeat and re-state to ensure correct reception.

Members contribute to an awareness of the group's process.

They
- Call attention to what is happening in the group.
- Invite others to give their opinions and perceptions of what is happening.

Members keep alert to ways in which they can support others in the group

They
- Ask helpful questions.
- Synthesize what is said.
- Use humor to help the group move along.

Members help the group by using a diagnostic approach.

They
- Understand why things have happened and offer insight and suggestions.

Members operate as full members of the group.

They
- Encourage quieter members.
- Bring the group back to task at hand.
- Organize "who will do what, and when."

Members contribute to productive goal setting and decision making.

They
- Restart the group by suggesting tasks or goals.
- Add information on ideas presented.
- Check with the whole group to see how much agreement is reached.

Adapted from: Panagos, B., & Watkins, C. (1994, December). *Team Building: Great Expectations.* Presented at the American Vocational Association Annual Conference, Dallas, TX.

Figure 6.8
Strategies For Team Blockers

Problem Type	Characteristics	Strategies
The Talker, Star, Superior One	Talks excessively & likes only own ideas	Interrupt as soon as he/she takes a breath by asking a task-related question. Ask them to summarize points or to be the note taker.
The Griper	Criticizes, complains, whines	If the complaint is legitimate discuss it. If not, offer to discuss it later.
The Digresser	Takes the group off task	If a comment cannot be related to topic at hand, refocus.
The Loner	Quiet, may be bored	Ask for suggestions. Or, ask "what" or "why" questions.
The Rusher	Rushes for premature decision	Consider the consequences of a hasty decision. Suggest other alternatives.
The Opposer	Plays the devil's advocate	Don't take offense. Feelings need to be validated.

Adapted from: Panagos, B., & Watkins, C. (1994, December). *Team Building: Great Expectations.* Presented at the American Vocational Association Annual Conference, Dallas, TX.

Figure 6.9
Assumptions About Change

Do Assume That

- change takes time
- change requires a plan
- change is a process, not an event
- change requires people to feel safe to take the risk
- change is, at times, frustrating, even painful
- change requires people to feel safe to take the risk
- conflict and disagreement are fundamental to lasting change
- change must be supported by those in positions of responsibility
- people who start the change process will, themselves, be changed in the process
- no amount of knowledge can ever make it perfectly clear exactly what actions should be taken in a given situation

Do Not Assume

- all people will change
- a particular version is the only one that could or should be implemented
- lack of implementation is due to outright rejection (search for causes)

Source: Wisconsin Department of Public Instruction (1994)

Figure 6.10

Vocational Academic Learning Action Plan

School

Curricula Subjects to be Integrated

Grade Level of Integrated Curricula

Length of Integrated Approach

# of Students

Objective

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Video?	
				Y	N

Figure 6.10, continued

Vocational Academic Learning Action Plan

1. Tasks A. Activities required to achieve each task B.	Person(s) Responsible	Expected Completion Date	Resources Needed/ Provided By	Video?	
				Y	N

Figure 6.11

Curricular Adaptation Planning Form

Instructor ______________________________ Date ______________

Current Instructional Plan	**Do changes need to be made in:**		
Content area/subject Estimated time	Instructional arrangement?	Lesson format?	Delivery of instruction (Teaching style & methods)?
Activity Materials	Social & physical environment or conditions, or lesson location?	Curricular goals & learning outcomes?	Instructional materials?
	Level of personal assistance?	Does an alternative activity needs to be arranged? Any other adaptations?	

Figure 6.12

Checklist for the Vocational Academic Learning Plan

Layout

- Is the appearance clean and free of distraction?
- Is it typed or clearly printed?
- Is there adequate white space?
- Are the answer lines or squares generous in size?
- Is the amount of material on the page limited to avoid overcrowding?
- Is the volume appropriate for student ability
- If photocopied, is it sharp and clear?
- Has unnecessary transferring been eliminated?

Directions

- Are the directions clear and concise?
- Are students familiar with all terms used, such as “omitted” or “odd numbered”?
- Have definitions or other details been removed and relocated elsewhere?
- Is a complete example provided?
- Is the sentence structure simple?
- Are the steps to follow appropriate for students’ skill levels?
- Does each section have its own directions?

Content

- Is content presented in small segments?
- Is a work bank provided when necessary?
- Is the reading level appropriate?
- Has far-point or near-point copying been eliminated?
- Is the material well organized?
- Has unnecessary verbiage been eliminated?

Testing

- Does the test begin with an easy questions?
- Does the student have adequate time to work without feeling pressure?
- Are recognition rather than recall questions used?
- Does each section have its own set of directions?
- Is “matching” grouped in small, even segments?
- Is a word bank provided for fill-in questions?
- Can a student be tested orally or on tape when necessary?

Figure 6.13
Curricula Integration Outline

Course/Discipline/Unit	Integration Focus	Grade Level	Estimated Time

Wisconsin Learner Outcomes

Instructional Objectives/Competencies

Materials, Supplies, A/V Equip.

Description of Integrated Learning Task

How are Vocational & Academic Courses Integrated?

Student Evaluation Criteria

Resources/References

Developed By/Date

Figure 6.14
Questions to Ask About Curricula Integration

When creating an integrated curricula, ask yourself these questions:

- Is the learning experience intellectually stimulating?
- Does it have a purpose that makes sense to students?
- Does it involve both vocational and academic teachers?
- Does it include a variety of instructional methods?
- Will it require adjustments in scheduling or other classroom logistics?
- Do assessment strategies require students to demonstrate their ability to use what they have learned?
- Are students involved in developing assessment criteria? In evaluating their own work systematically?
- Are parents encouraged to support students and make suggestions?
- Is the community used as resource in developing or evaluating the project?

Source: New Castle County Vocational Technical School District, Wilmington, DE.

Figure 6.15
Planning Your Program Evaluation

Evaluation Questions (Claims or Outcomes)	Information to be Collected (Claims Categories or Indicators)	Information (Data) Sources	Instruments, Methods, Procedures (Comparison Standards)

Figure 6.16

VALP Team's Final Products

The final products produced by each VALP Team will provide a record of the project's process and achievements, and will provide guidelines for those wishing to replicate your efforts to integrate vocational and academic education in ways that effectively include individuals from special populations (students with academic/cultural disadvantages, students with disabilities, students with limited English proficiency, and teen parents). CEW project staff will work closely with each VALP Team as members develop these products.

Final products should include:

1. A statement of the VALP team's purpose ("Mission statement") and a statement of the VALP team's functional definition of integrated academic and vocational education.
2. A list of all VALP team members and a description of the role that each played in developing and implementing the integrated curriculum.
3. Copies of the curricula integration outlines showing the subject areas/topics integrated, and the teachers, administrators, and other staff involved. For all material copied or quoted from other sources (textbooks, workbooks, etc.) please include full reference information: name of publication, date it was published, authors, publisher, and publisher's address/phone number.
4. Copies of lesson plans that operationalized these integrated curricula. Be sure to describe the integration process/procedures whenever applicable.
5. A description of support strategies and accommodations used to ensure that students from special populations were included effectively throughout the integration process. Be specific both in terms of the individuals and populations served and the instructional strategies and/or accommodations used. Include copies of individuals' IEPs (minus names, etc.) or individualized career plans, as well as descriptions of instructional support strategies, personal support strategies, etc.
6. Indicators that administrators and the wider community (especially local businesses) support the VALP Team's curricula integration work.
7. A description of secondary and postsecondary articulation procedures, both formal and informal. Include copies of articulation agreements as applicable.
8. A statement specifying which of the Wisconsin Learner Outcomes were addressed as part of the curricula integration effort.
9. A description of the program evaluation procedures used. Include data collected to measure the formative impact (while the integration effort is going on) and the summative impact (after the integration effort is finished), such as:
    A. A detailed description of any control groups or comparison groups used as part of this evaluation.

Figure 6.16, continued
VALP Team's Final Products

B. Copies of pre/post tests used with students and/or staff.

C. Compilations of the results of those pre- and post-tests, both for the experimental group (those experiencing the integrated curricula) and any control groups or comparison groups used.

D. Data enumerating the number of students participating in the integrated curricula at the beginning of that process, attendance patterns during that process, and number/percentage dropping out of the integrated curricula but not school; and number/percentage of those participating in the integrated curricula dropping out of school totally. If control or comparison groups are used, similar data should be generated for them.

E. Data on the perceptions of students, staff, administrators, parents, and local businesses regarding the integration project. This might include questionnaire results, interview results, or other means to measure their perceptions.

F. Data on students' performance on the integrated curricula, including copies of performance measurements (tests, portfolios, etc.) used, assignments given, etc.

G. Suggestions to others who may want to replicate this curricula integration effort.

H. Plans for continuing or expanding the integrated curricula during the coming semester or school years.

10. Four hours of video that portray the curricula planning and integration process as it unfolds. This can include segments showing the VALP team at work, students at work on activities associated with the curricula integration process, and related elements of the curricula integration process.

The process of developing an action plan can be very intense, according to program participants. There are many tasks that need to be accomplished when developing a plan to integrate vocational and academic education. Identifying the objectives and the method to be used in attaining them is critical. Additionally, it is important to assign responsibility for carrying out the activities, set up an expected completion date, and identify the resources needed. This is also an appropriate time to identify activities for videotaping. Videotaping the development and implementation of the programs will be a useful tool for informing faculty, students and the community about the program.

To effectively include students from special populations, some modifications in instructional plans may need to be made. Giving consideration to these adaptations prior to the implementation of the project will increase the likelihood that they will be made in a productive manner. Instructors familiar with the needs of special populations students should be involved in this developmental activity.

Developing the integrated curricula involves detailing which units or subjects will be integrated, the instructional competencies being addressed, how the integration will occur, how the student will be evaluated, and any resources which may be needed. VALP team members were also asked to identify which of the Wisconsin Learner Outcomes are being addressed through the integrated activity. The Curricula Integration Outlines can also be used to inform other teachers and administrators about the integration plans.

Developing the integrated curricula involves detailing which units or subjects will be integrated, the instructional competencies being addressed, how the integration will occur, how the student will be evaluated, and any resources which may be needed.

The final products developed by each VALP Team will provide a record of project processes and achievements, and will provide guidelines for those wishing to replicate these efforts to integrate vocational and academic education in ways that effectively include individuals from special populations. CEW staff were available to work with each VALP team in the development of these final products.

Program evaluation plans should be established prior to the implementation phase of the integration process. Regular data collection should be planned and executed in a timely manner to assure that there will be an effective evaluation of the integrated program. When evaluation plans are not developed prior to the implementation of the project, there seems to be little time dedicated to the evaluation process which can result in less informative evaluation results.

Throughout the week-long training session, which included training related to various aspects of vocational academic education, techniques for working with special populations, "Developing Your VALP Team" and "Developing Your Plan Of Action," participants were able to become more comfortable with the idea of integrating the curricula and working as a team to accomplish goals and objectives. Repeatedly, comments were made regarding the value of planning ahead and having a strong sense of team commitment. A lot of time and energy is involved in developing a plan to integrate vocational and academic education; however, when the development process is well planned the process becomes much easier.

Summary

7

By Catherine L. Weis, Outreach Specialist, Center on Education and Work

Contributors to Success

Although the majority of teachers are conceptually supportive of integrating vocational and academic education, the implementation of integrated programs has been viewed as a major challenge (Lankard, 1994). Barriers to implementation have been discussed on numerous occasions by various authors, including Grubb and Krabouskas (1993) who note divisions of discipline and status among teachers and inadequate leadership as some of the obstacles. The truth is that teachers cannot make significant changes by themselves.

The four sites participating in this project were quite diverse. Each faced different challenges and dealt with different issues on a daily basis. However, despite the diversity among the groups, their views regarding the factors which contribute to the success of integrated programs had a number of common threads. Needs associated with success included the following:

- staff development which focused on collaboration and strategies for working as a team;
- time to plan the program and develop the curricula (the VALP teams the summer work time was especially helpful);
- the availability of funds to support the integrated program and necessary training;
- committed VALP team members who were willing to work as a team; and
- strong, active support from administration and other staff.

Despite the diversity among the groups at each of the demonstration sites, their views regarding the factors which contribute to the success of integrated programs had a number of common threads.

Benefits of Vocational and Academic Integration

As seen in the previous chapters, the benefits of integrating vocational and academic education are numerous. Although students are the primary beneficiaries of vocational and academic integration, they are not the only ones. Teachers, administrators, schools, and the community also reap the benefits of integrating vocational and academic education.

Students—Students increase their academic and technical knowledge and skill levels, while preparing for their future with a better understanding of the connection between high school, life, and work.

Teachers—Teachers are rewarded by seeing their students make these valuable connections. They feel a sense of accomplishment when the students begin to "get it."

Administrators—Administrators are able to take active leadership roles in the development of programs which provide opportunities for diverse groups of students. They can also play a major role in rallying support for the programs, staffing, scheduling, and curriculum design.

Schools—Schools benefit by increasing their communication with the community, and developing the possibility for articulation agreements with postsecondary institutions.

Community—When students realize the relationship between school and work, they become more inclined to pursue postsecondary education and training. Thus, increasing the number of skilled workers entering the community's workforce.

Without the integration of vocational and academic integration, students fail to see the critical connections between subjects, not to mention between learning and life.

Without the integration of vocational and academic integration, students fail to see the critical connections between subjects, not to mention between learning and life. When students participate in fragmented coursework, they shift gears, much like an automobile with a manual transmission. Shift into technology education. Shift from technology education to English. Shift from English into biology. Students shift out of one subject into another. On the other hand, when students participate in vocational and academic integration they shift gears more like an automatic transmission. They switch back and forth between gear without removing themselves from one area and in to another.

Positive Outcomes

Vocational and academic integration is a necessary part of the broader school restructuring and reform movement and is a key component in the School-to-Work Opportunities Act. The positive outcomes which result when academic and vocational courses are integrated are important, and seem to have a significant impact on the vocational future of students.

The four integrated programs outlined in this publication yielded a number of positive outcomes, some of which are outlined below:

- class attendance is improved in the integrated programs;
- there is an increase in the retention of students;
- there is increased rapport between students of varying academic abilities;
- students learn to connect skills learned at school with skills needed for employment;
- there is measurable improvement in the grades of the students in the integrated programs;
- there is an increase in the number of students expressing an interest in postsecondary education and training; and
- a cooperative working relationship is developed between the vocational and academic teachers.

For More Information

For additional information regarding these programs, contact the individuals listed below.

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Water Quality Analysis Project
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